

# THE IRON AGE

THURSDAY, JANUARY 26, 1888.

## A New Boiler Plate Planer.

Among the various new forms of machine tools which have been brought out of late, boiler plate planers have been given little prominence, lack of novelty in design in this particular branch having been very marked. We take pleasure, therefore, in presenting this week engravings of a new tool of this class built by Messrs. B. W. Payne & Sons, of Elmira, N. Y., and now in use at their works. In several respects, it will be found to differ from existing types of such planers and to embody features which add considerably to convenience and accuracy in working.

The engraving on this page will give a fair idea of the general arrangement

which the spring bolts pass. Fig. 6 shows the disposition of the carriage and tool post and explains also the gearing by which longitudinal travel of these is effected. Running the entire length of the ways is a grooved rod, A, to which power is transmitted through the pulleys and gears shown in Figs. 3, 4 and 5. By means of a feather with which this rod is fitted, it imparts rotary motion to a worm, B, fixed in the carriage, as shown in Fig. 6, and gearing with a rack, C. The worm, and with it the carriage, is thus made to travel along the rod A until the motion is reversed. This is accomplished by stops on the rod D (see Figs. 1, 2 and 6), which can be clamped at different points, admitting of variable lengths of

commend itself. It avoids the expense of a long screw, and the worm, when worn, can readily be replaced by a new one. The planer, we understand, is put on the market by Messrs. Payne & Sons, and will recommend itself for use in boiler shops.

The New York office of the works is at 45 Dey street, under the management of Mr. H. C. White.

## Compound Engines.

In a recent article on compound engines, the *London Engineer* says:

The conditions under which steam is worked in the compound engine are necessarily peculiar. In the single-cylinders

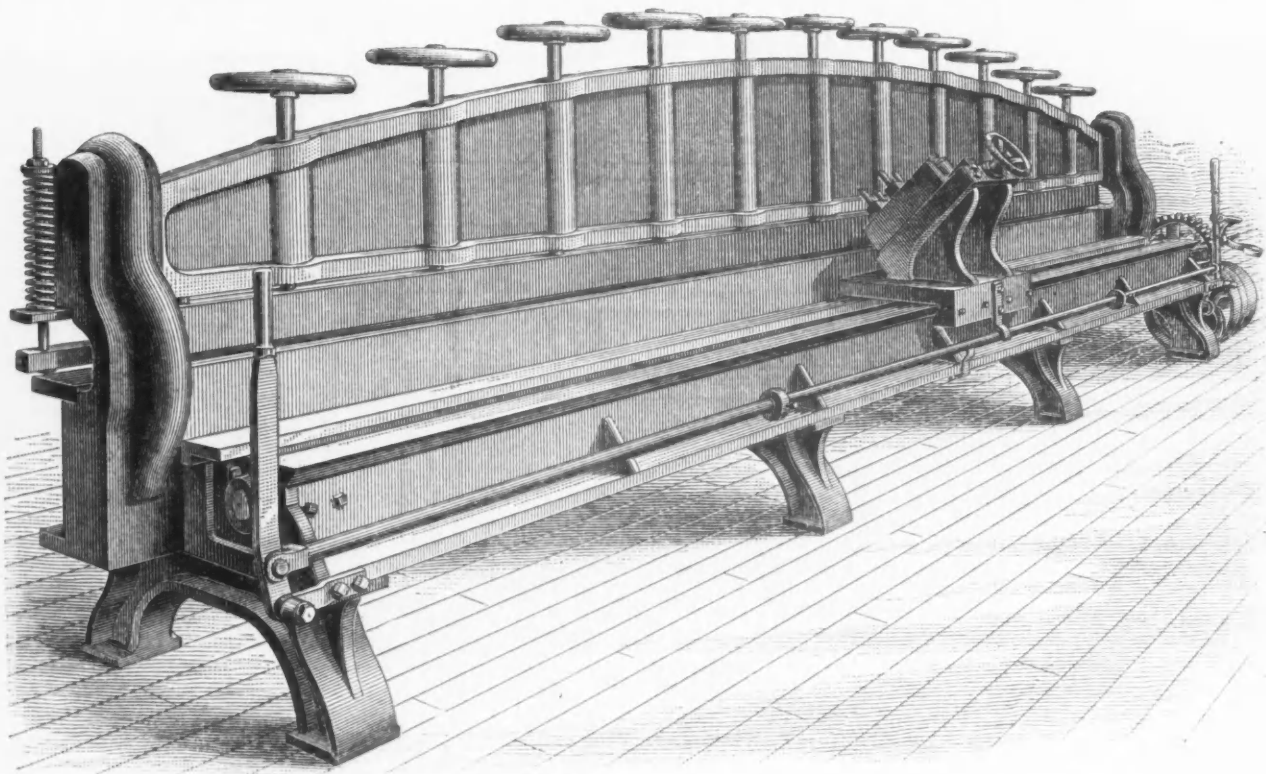


Fig. 1.—General View.

BOILER PLATE PLANER, BUILT BY MESSRS. B. W. PAYNE & SONS, ELMIRA, N. Y.

adopted, while the elevations, sections and details on the succeeding two pages more clearly explain some of the peculiarities of the design. One of these is a plate or clamping bar, A A (Fig. 2), which by means of screws and hand-wheels is brought down upon the boiler plate to be planed, and firmly holds it in position. In other forms of plate planers, as some of our readers undoubtedly know, the boiler plate is held by clamping screws alone similar to those shown in our engravings. As a consequence all these screws along the whole length of the planer must be brought down on the plate to hold it securely, unless the latter be exceptionally free from waviness. The clamping bar in the present design obviates all this, three or four screws being sufficient to securely hold the work on the bed of the planer and an even distribution of the clamping pressure being obtained. As the clamping screws are released the bar A A is raised from the work by two helical springs arranged at the ends as shown in Fig. 2. The angle plates are bolted to the frame of the planer and have openings through

stroke. A vertical arm attached to the carriage striking either one of these stops moves the rod D, which is pivoted in the manner shown in Fig. 1, in either one direction or the other, and, through a belt shifter, transfers the driving belts from the loose pulleys to the fast one in the center. One of the belts is crossed, so that they move in opposite directions. It will be noticed that the shifting rod has at each end a lever, so that reversal of motion may be effected by hand at any point desired. The great length of the planer of course makes it desirable to have two such levers.

From the end elevation, Fig. 3, on page 137 it will be understood that any length of boiler plate can be taken in, though the travel of the tool post is only 16 feet. When this length has been planed the clamping bar can be eased, and the plate shifted along the bed and again secured. The whole design, as the engravings show, is very simple, and the tool appears well adapted for rapid and good work. The worm and rack arrangement, illustrated in Fig. 6, is a feature of some interest, and will at once

engine with an early and sharp cut-off it is known that the smaller the clearance the better. The steam required to fill the clearance space does no work at the higher pressure. Its duties only begin when the admission valve closes and expansion commences, and the whole of the work done in thrusting it out of the boiler is lost. If the engine did not work expansively the clearance steam would represent a total loss. It is always the practice of the best makers, accordingly, to reduce clearance to the smallest possible limits; and this rule can, of course, be observed with the high-pressure cylinder of a compound engine; but it cannot be observed with the low-pressure cylinder. That draws from an intermediate receiver, and during the whole time that the admission port is open the steam is expanding almost precisely as it would expand in a single-cylinder engine with ports so small that wire-drawing took place. The back pressure in the high-pressure cylinder is a variable quantity. At the moment the exhaust ports opens there is the lowest pressure in the receiver, and the back pressure drops. The steam

valve of the low-pressure cylinder being then closed, the pressure rises in the receiver until about half-stroke, when the pressure in the receiver is at a maximum. The low-pressure crank then turning the dead point, the low-pressure cylinder begins to take steam, and the receiver pressure falls. The result is the characteristic curve of the exhaust line on high-pressure cards. At first sight then it seems obvious that the cut-off should take place as early as possible in the second cylinder, in order to eliminate the loss caused by the virtual clearance constituted by the intermediate receiver. But it must not be forgotten that what may be good for the low-pressure cylinder may be bad for the high. Too early a cut-off in the former may bring about undue back pressure in the latter. There is some fixed relation between the pressures, points of cut-off, and capacity of

same power on each crank; and all the time it may be a fact that the turning moments on the crank cheeks are far more variable than there would be in engines designed with more regard for economy of fuel and less for equalization of power. Of course, what holds good for the ordinary two-cylinder compound also holds good of a treble-cylinder engine.

Concerning the influence of the dimensions of the intermediate receiver on the economy of the compound engine much remains to be learned. Indeed, the subject has hardly as yet received any attention whatever. Our own experience goes to show that when the receiver is so small and the setting of the valves so arranged that the exhaust line of the high-pressure cylinder is curved upward, great economy results; and the reason appears to be that the rise of pressure and temperature in the

tion of the boiler was 10.75 pounds per 1 pound of coal, or about 20 per cent. less than that of the best engines.

In the triple-expansion engine we have two receivers to deal with, and so far, therefore, the conditions are more unfavorable to economy than they are in the compound engine; but this is more than compensated for by the higher pressure and greater range of expansion under favorable conditions.

In the compound engine we always find some water, however little, in the low-pressure cylinder at the beginning of the stroke; but in well-designed triple-expansion engines it is usually impossible to detect a trace of moisture in the low-pressure cylinder; indeed, when the indicator cock is opened the steam sometimes issues from it so dry as to be almost invisible—in marked contrast to the high-

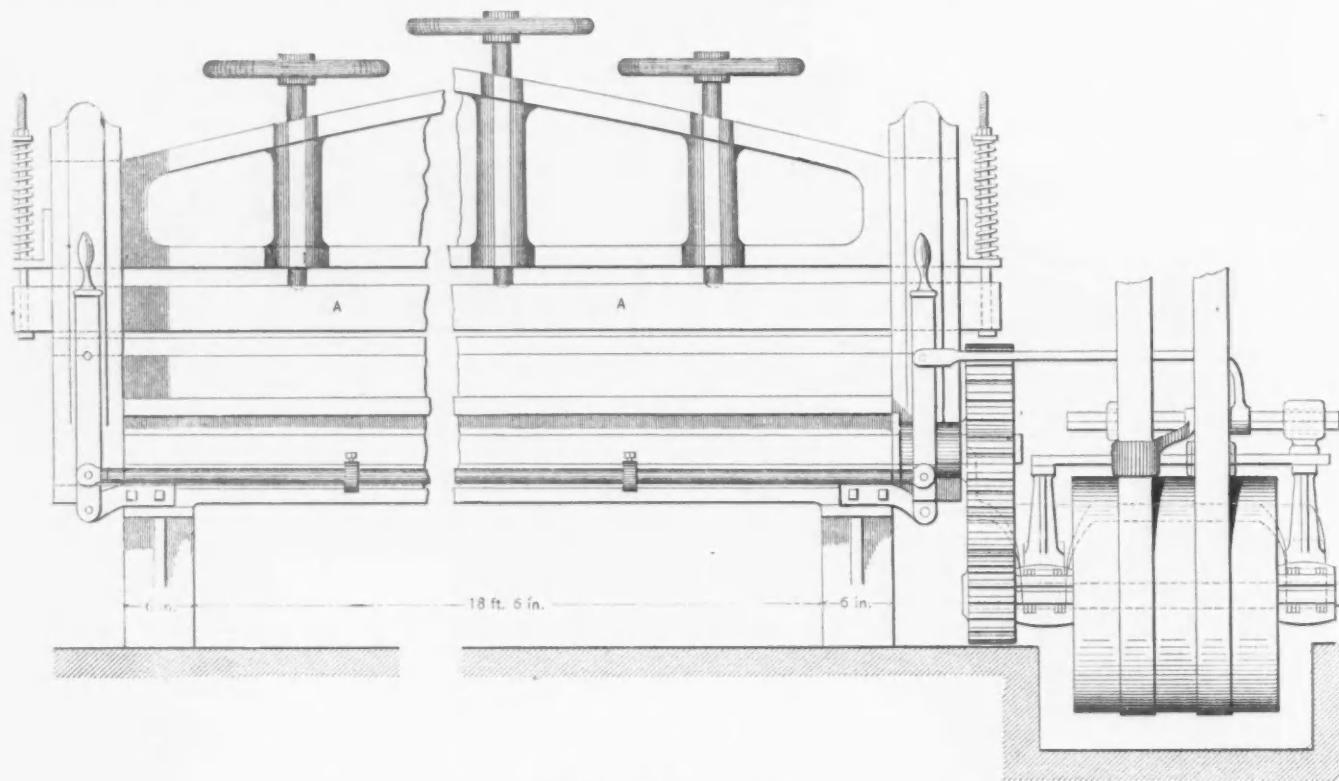


Fig. 2.—Side Elevation.

BOILER PLATE PLANER, BUILT BY MESSRS. B. W. PAYNE & SONS, ELMIRA, N. Y.

the intermediate receiver which will secure a better economical result than any other. But this must be settled for every engine, or every group of similar engines, on the basis of the working conditions of the engine or group of engines, and it does not admit of extended generalization. There are besides two factors in the problem which must not be forgotten. The first is, that it is desirable that the same power as nearly as may be should be developed on both cranks; the second is, the peculiar and as yet not well understood influence exerted on the quality, as we may phrase it, of the steam by the dimensions of the intermediate receiver. Now, as to the first point, we are strongly of opinion, and we know that many highly competent engineers agree with us, that far too much importance is attached to getting the same work done on each crank. We hold that within reasonable limits it is a matter of no consequence whatever that this object should be secured. It is certain that it is not worth the coal the securing of it costs in only too many cases. We find, indeed, engineers altering points of cut-off, receiver capacities, dimensions of cylinders—anything and everything, in short—without the least regard for economy, and pointing proudly to engines which develop to within a small fraction of the whole power the

intermediate receiver dries the steam, and it accordingly works with greater efficiency in the low-pressure cylinder. A suggestive and interesting example of this is supplied by one of the engines, Mr. Cooper's, tested at Newcastle last summer. It was patent to every one that the exhaust from this engine was very wet; water came out of the chimney in fine spray, and it was thought by some that the boiler was priming. It was not, as a matter of fact. When Mr. Cooper had taken his engine home, like a wise man he experimented with it, and by partially filling up, and so reducing the space in the intermediate receiver, he effectively dried his steam and augmented the economy of his engine. The high-pressure cylinder is 6 inches and the low 9 inches diameter, with a stroke of 11 inches, and the intermediate receiver space was 875 cubic inches. It was 2.8 times larger than the capacity of the high-pressure cylinder, and more than 1.25 times larger than the low-pressure cylinder. The diagrams taken from this engine were, however, very good, especially the low-pressure cards, and we have no doubt that had the steam gone dry into the low-pressure cylinder, instead of wet, the result obtained would have been far better than it was—viz., 3 pounds per indicated horse-power per hour. The cylinders are unjacketed, and the evapora-

pressure cylinder, in which, for some wholly unexplained reason, the condensation is always enormous.

The most prominent defect about the low-pressure cylinder in triple-expansion engines is that there is often considerable back pressure, due to the difficulty of working in ports and passages of sufficient dimensions to suit the great size of the cylinder without at the same time making the slide or piston valves of huge proportions. An instance came under our own observation—namely, in which, while the vacuum was  $27\frac{1}{2}$  inches, the back pressure amounted to no less than  $3\frac{1}{2}$  pounds. That is to say, the vacuum in the cylinder was 7 inches less than that in the condenser. As the total average pressure in the low-pressure cylinder was only 9 pounds, it will be seen how great was the loss. It represented in this case 50 horse-power out of a total of 400. The pressure in the last cylinder of a triple-expansion engine is so low and the piston is so large that the loss caused by a bad vacuum or contracted ports may easily become very great indeed. A difference of a pound or two between the actual and the possible is much more serious than appears at first sight. It might almost be said, "Take care of the low-pressure cylinder and the high-pressure will take care of itself."

### Tankage of Natural Gas.

Arrangements are being made at Fort Wayne, Ind., for a series of experiments in connection with the use of natural gas, which promise to be of great interest to manufacturers who desire cheap fuel, and to railroad companies whose lines penetrate natural gas districts. The general officers of the Fort Wayne, Cincinnati and Louisville Railroad have for some time believed that natural gas stored in tanks, said tanks to serve as a tender to the locomotives, could be used as fuel for all the

any interference with an application for a patent. The practicability of the plan, we understand, has now been demonstrated.

The first trial was made at Montpelier, Ind., where there are two strong gas wells. A wrought-iron cylinder, 18 feet long and 2 feet in diameter, with heavy ends screwed in, was attached to the biggest well. The cylinder had been subjected to careful tests at the shops and was provided with gauges to register the pressure. The gas from this well has a pressure of 450 pounds to the square inch, and when it was turned

latter of steel, until the question was fully settled to the satisfaction of the railway experts and officials that the transportation and use of natural gas as a fuel for locomotives and shops was an accomplished fact. This once done, the preparations were ordered for the attempt at the general use of natural gas as the fuel of the road. For this a trial tank-car of the shape and size of those used by the Standard Oil and various tank-line companies of the country is being built. It will be of steel sections screwed together and banded with wrought iron welded on

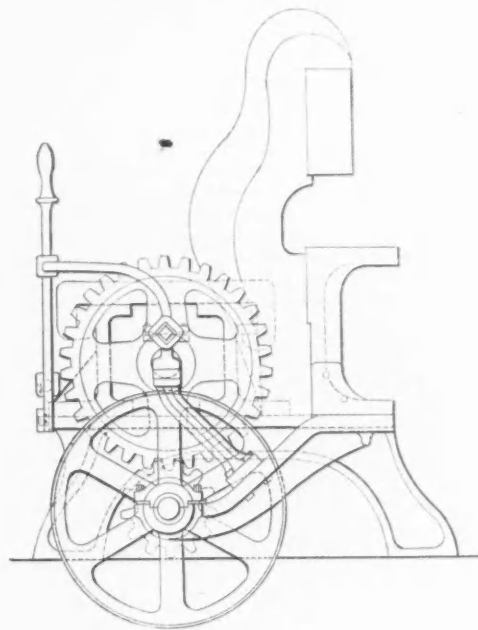


Fig. 3.—End Elevation.

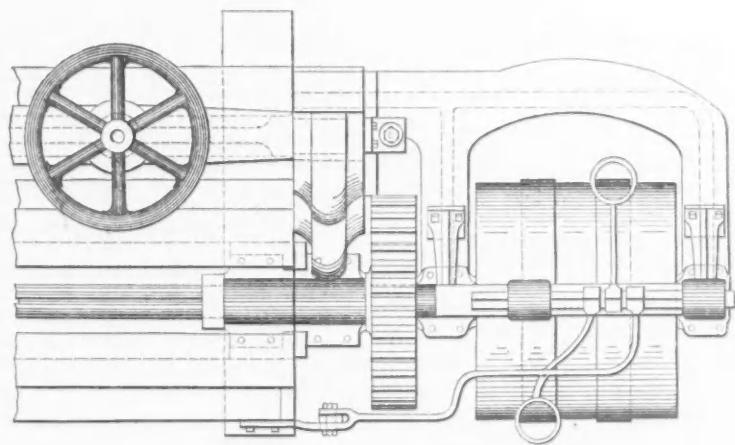


Fig. 5.—Top View of One End.

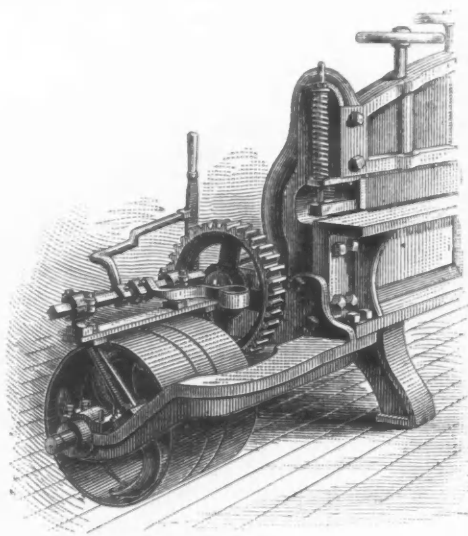


Fig. 4.—End View, Showing Reversing Gear.

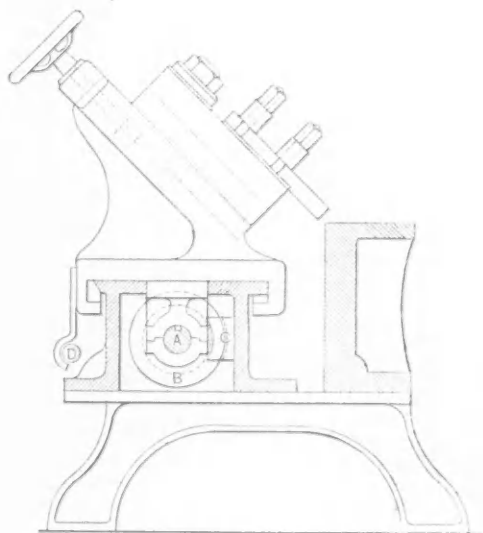


Fig. 6.—Cross Section, Showing Traversing Gear.

BOILER PLATE PLANER, BUILT BY MESSRS. B. W. PAYNE & SONS, ELMIRA, N. Y.

engines on their road. Its route is through the heart of the great Indiana natural gas field, with wells of greater or less capacity. At or near every station almost from Spiceland, just north of Rushville, to Montpelier, a few miles south of Fort Wayne, most of these wells are of great volume and of pressure, flowing from 3,000,000 to 12,000,000 cubic feet of gas every 24 hours. Several weeks ago W. W. Worthington, General Superintendent of the road, together with the General Master Mechanic, began to experiment on the transportation of natural gas, not in pipe lines, but in vessels of wrought iron of such form and shape as were specially adapted for use in heating and lighting cars and for fuel in the fire-box of a locomotive. The matter was kept secret in order to guard against

on, the gauge on the cylinder fairly danced round, and in a minute almost came to a standstill, showing that the cylinder was full and would register no more. The cylinder was then hoisted into a freight car and hauled to Fort Wayne. Here it was taken into the company's shops and attached to the usual natural gas burning apparatus with a regulator that controlled the pressure under which the gas had been forced into the cylinder, so that it flowed out in a steady, regular current. The gauge showed that the gas in the cylinder had lost but little of its pressure, and it supplied light to the gas burners in the shops for several hours, besides heating one large stove and one forge. Elated with the entire success of this, the first trial, the tests went steadily on with larger cylinders and circular tanks, the

at the joints, so as to stand the great pressure. This car will be hauled just back of the tender, which will only be used to carry water, and a pipe from it will lead through the regulator placed on the tender to the fire-box of the locomotive. Its capacity will be equal to as many thousand cubic feet of gas as will represent enough tons of coal to make the entire trip over the road. At Hartford City, Eaton, Muncie, and other stations will be arrangements for tapping the wells there for filling the tank-car at any time it runs low.

How great the saving of fuel will be can be seen from the fact that any one of the big wells on the line of the road flowing 8,000,000 cubic feet per day will furnish a supply for the entire line. It costs, by contract price, \$1200 to bore such a well. The interest on this sum at 6 per cent. is \$72



per year, or 19 cents per day, as the total expense of all the fuel for a big railway corporation. This sounds either too marvelous or on the borders of the ridiculous, yet it is entirely within the bounds of possibility. When the gas-tank car-supply system, with its minor details of heating the cars and lighting them from small cylinders of gas, is in full operation on his own road, General Superintendent Worthington, at the head of a big syndicate, will offer tank-cars filled with gas to factories where natural gas does not abound, and to which it cannot be economically conveyed by pipe lines. It will be sold very cheap, and one of the tanks run on a side-track beside the engine-room and attached to the pipes and regulator will keep the furnace fires going for perhaps weeks, and at a cost so low as will astonish lovers of economy. So satisfied is Superintendent Worthington, after his experiments backed up by the judgment of his master mechanics and expert machinists and engineers, that he and his syndicate have secured control of 8000 acres of gas-bearing land along the line of his road, on which they have just completed their eighth well, and are putting others down as fast as machinery can do it. A number of railroad companies now have their representatives at Fort Wayne, observing the progress of the preparations which are being made to use natural gas in the manner indicated.

We should add here that as natural gas, however much compressed, is enormously more bulky than coal for an equal heating power, it may well be doubted whether the experiments will ever prove a financial success, and as the natural gas is easily and cheaply conveyed in pipes, it is difficult to see how transport in cars is economically advisable except in very special cases where the use of a gas free from sulphurous fumes gives, irrespective of cost, advantages not attainable with coal. Such cases, however, are rare, especially as producer gas, as used in the Siemens-Martin furnace, can be easily made from very inferior coal.

The latest novelty in the Otto gas engine line is a quadruple arrangement. Two cylinders are placed on each side of a single crank shaft, the four pistons being attached to this one shaft. The principal peculiarity, however, is that the valves of the four cylinders are so timed that one of the four pistons is always under the impulse of an explosion—that is, immediately piston one has completed its working stroke piston two commences its working stroke, then piston three follows, and finally piston four. Piston one is now ready for its next stroke. In this way the crank shaft is under a continuous impulse. A very simple device for varying the power of the engine by reducing the quantity of gas admitted is added.

Although the results obtained with triple-expansion engines are in a high degree satisfactory, it is very probable that the limit of excellence has not yet been reached. Unfortunately, the conditions under which marine engines are worked are unfavorable to scientific investigation. The most careful and even costly experiments are carried out in the shape of progressive speed trials, but no one seems disposed to expend a few dollars in settling questions of vital importance connected with the working of the engines propelling the ship tested. Thus, for example, it is not too much to say that no one knows with any approach to certainty how much water a pound of coal can convert into steam in the normal marine boiler; nor can any one tell what weight of feed-water is needed per horse-power per hour. More or less good guesses are made, no doubt; but, after all, they are but guesses, and with conjecture exact science has

nothing to do. It seems to us very remarkable that not one of our great ship-building firms has ever turned its attention in this direction. Perhaps the idea is entertained that nothing would be gained by an inquiry of the kind, a conclusion which certainly does not commend itself to us. A direct result of the ignorance resulting from the absence of experimental data is that we have no reason to conclude that even the best engines running are the best that can be made. Indeed, we believe that it may be shown that this is not the case, and that the system, or want of system, by which triple-expansion engines are made can only give the best economical results by chance, and never with any approach to certainty.

#### The Dam of the San Francisco Water Works.

There are at present the three largest dams in the world under construction on the opposite sides of the Atlantic, at the three places well-nigh the most extreme from each other which could be selected. One to divert the Chagres River at the Panama Canal, another the Quaker Bridge dam in connection with the new water-works supply of New York City, and the third the San Mateo dam of the San Francisco Water Works. As the California dam is in an advanced state of construction it is to be assumed that many results obtained will serve as precedents in the construction of the other two works. The water-works of San Francisco originated from a very small beginning in the early days of the settlement of that place in the beginning of the rush for gold at California nearly 40 years ago, when the water was sold in barrels at \$40 per barrel to the early settlers at that place. A few years later a water company was organized and a water-works system laid out for the supply, which was deemed ample for present and prospective needs; but in a few months it was found that the city was growing more rapidly than had been anticipated, and continual measures for an enlargement of the water supply have been necessary from time to time to keep pace with the growth of the city. At the present time the company have 200 miles of iron mains and distributing pipes, obtaining the greatest supply of water by an aqueduct extending 30 miles into the suburbs to Lake Honda, and a storage reservoir is under construction by building a great dam across the San Mateo Valley. This dam is 170 feet in height, 176 feet wide at the base and 20 feet wide at the top, forming a reservoir 1800 acres in extent, with a storage capacity of about 35,000,000,000 gallons. The concrete of which this dam is composed is made from the crushed rock, which is thoroughly washed, 22 cubic feet of crushed stone being mixed with one barrel of Portland cement and one barrel of sand, commingled by a mechanical mixer, from which it is ejected into pipes which lead to the portion of the dam where the work is under process of construction. The concrete is dumped into molds of plank formed in an irregular outline of the general dimensions of about 20 feet square and 6 feet thick. When the framework is filled it is covered with boards which are kept wet to prevent rapid drying, and in the course of a week the framework can be removed. The dam is built up in this way rather than as a huge monolith, adding the concrete uniformly over the whole surface of the dam.

It is stated that the large Russian iron-clad *Tchesme*, now being finished at Sebastopol, and having a displacement of over 10,000 tons, is to have boilers heated with petroleum. If the results correspond to

what the Sebastopol engineers expect, the example is likely to be followed elsewhere. In this connection we may note an account in *La Nature* of a gas-boat, as it may be called, the *Volapuk*, recently constructed, in which a gas engine of 6 horse-power is driven by air charged with carburetted hydrogen, by passage through petroleum oil. There are two pistons, and the explosive mixture is ignited by means of a spark from a magneto-electric arrangement.

#### The Coke Supply of Southern Furnaces.

E. O. Nathurst, of Tracy City, Tenn., writes to the *Chattanooga Tradesman* a letter from which we extract the following:

Take a furnace plant making 100 tons of iron, with the lean refractory ores that will probably be used here in Tennessee. We may expect to use 200 tons of coke daily; certainly the furnaceman must be sure of such quantity. This represents a plant of not less than 200 coke ovens and 400 tons of coal daily for 48 hours' coke, and 72 hours' coke for that charged on Fridays and Saturdays, with which to bridge over Sunday, when no coke is drawn in the South. If 400 tons of coal is charged daily into these 200 ovens and the coal is good coking coal then we may expect 60 per cent. of it in coke, or 240 tons of coke per day. This will give the furnace 40 tons per day more than it will need in the week days, but that will only supply it on Sunday while no coke is made. Even if the furnace does better than 2 tons of coke to a ton of iron, still it will take 200 coke ovens, because some of these will always be out for repair. If we agree, then, that a 100-ton furnace needs 200 coke ovens, the building of these is our first item. I have seen many different estimates of the cost of building ovens, from \$150 to \$550 each. I think it safe in a general average to say \$350, when built with fire-brick, and no other brick should be used. The 200 ovens, then, will cost the furnace \$70,000. The opening of the mines to supply 400 tons of coal regularly to the ovens will cost in the Sewanee vein of coal about \$15,000. It will take all of \$15,000 more to put up a saw-mill, build tenement houses, &c. Hence, an estimate of a coke plant to supply a 100-ton furnace with coke should not be made at less than \$100,000; and it is not completed in a day. It takes time and skill to have it in operation in six months; and it would be safer to take 10 months for the work.

**Electrified Balsam.**—According to *Engineering*, Mr. C. V. Boys has described an interesting experiment he has made with electrified gums and balsams. If sealing-wax or any such sticky material is melted in a cup and put on the conductor of an electrical machine, it throws out threads and fibers, which break into beads. The cup containing the gum should be inclined from the operator and the electrical machine before the latter is worked, else both will be covered by an invisible sticky web. Burnt india-rubber also sent out the filament; but Canada balsam appears to show the phenomenon best. When a candle flame is held near a cup throwing out such filaments they shoot to the flame, and sometimes cover the candle, and sometimes discharge into the flame and turn back into the cup. In a few minutes a large quantity of these sticky threads can be made, and, as they break into beads, Mr. Boys points out that this plan can be used to pulverize these substances, which are not easily pulverized in the ordinary way.



### The Anniston Pipe Works.

Near the two new coke furnaces of the Woodstock Iron Company are located the Anniston Pipe Works, of which W. Spencer is president, R. F. Carter is superintendent, and T. Smith is secretary. A large amount of grading has been done, 60,000 cubic yards having been moved from the hillside and a large area filled up, while work is just going forward to excavate the foundations for the pits. The works, which have a tract of 14 acres of land, are to be 504 feet long by 94 feet wide, with an engine-house of 42 x 62 feet, a machine shop of 52 x 77 feet, and a foundry of 44 x 78½ feet. The main building alluded to above will contain six Colliat cupolas, 72 inches in diameter shell and 60 inches lined, driven by three No. 6 Root blowers, run by a 100 horse-power engine, the make of which has not yet been decided upon. The plant is expected to have a melting capacity of from 18 to 20 tons per hour, so that it will consume, if running full, by far the greater part of the No. 2 Foundry and mill irons which the two coke furnaces of the Woodstock Iron Company are likely to make. The works will have 12 core ovens—four 14 x 22 feet, four 15 x 22 feet, and four 16 x 22 feet. The cupolas are grouped in twos, with their iron runners converging toward a track upon which the ladle will run. There are six pits, the largest with a 24-foot outside and 16½-foot inside radius, giving a pit 7½ feet across, while the smallest will have a 23½-foot outside and 17½ inside radius, giving a pit 6 feet across. Before each pit is a 26 x 20 foot mold oven. The pipe after being cast is dumped on either side on horses or trucks and is conveyed to the two cleaning houses, each 275 x 38 feet, extending from the main building at right angles to its axis. Here the pipe is cleaned, then heated in an oven, put into the tar, dried and then goes to the shipping wharf. The yard is 175 feet wide by 1500 feet long, inclosed by bulkheads and is at such an elevation that the yard floor is flush with the car floors. The iron yard is at the level of the cupola charging floor, and the coke is discharged from the cars on elevated tracks into bins, from which the fuel supply is to be drawn into trucks at the cupola charging level. Similarly convenient arrangements are to be provided for the loan and sand, while tracks, turntables and 30 cranes will allow of cheap and rapid handling in the works. The company will employ at the start from 300 to 350 men and will make all sizes of pipe from 3 inch to 48 inch.

The annexed table giving the weight of water per cubic foot at different temperatures may prove useful:

At 32° F., 1 cubic foot weighs 62.417 pounds.	
40° " " " " "	62.423 "
50° " " " " "	62.409 "
60° " " " " "	62.367 "
70° " " " " "	62.302 "
80° " " " " "	62.218 "
90° " " " " "	62.119 "
212° " " " " "	59.7 "

From this it will be seen that in heating water from 60° to 212° F., its bulk is increased about  $\frac{1}{2}$  part, or nearly  $4\frac{1}{2}$  per cent. The capacity of any given vessel of irregular shape may be found when no measure is at hand by simply weighing the vessel empty, then filling it with water and weighing. The difference will be the weight of the water, and this weight divided by the weight of a cubic foot of water at that temperature will give the cubic contents of the vessel, from which its capacity in quarts, gallons, or any other measure may be easily calculated.

A report from Montreal, Canada, is to the effect that a steam catamaran, intended for whale and walrus hunting in the Arctic

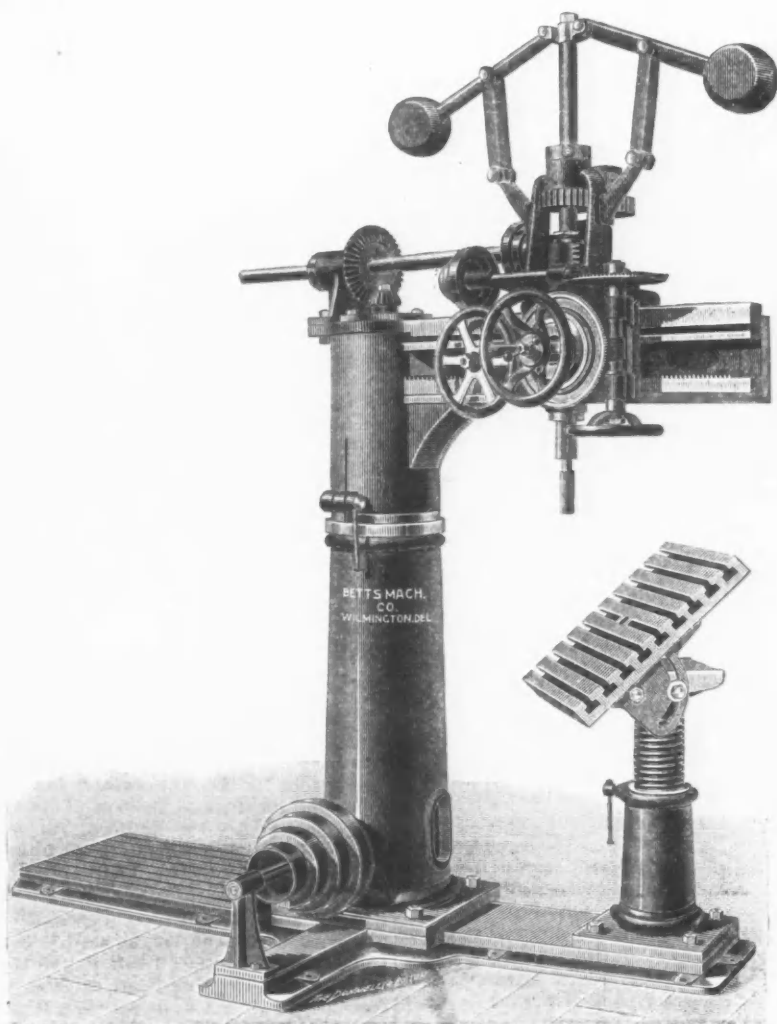
regions, is being built there. It is described as having two steel cigar-shaped hulls, each 65 feet long, and built in two compartments, one for water ballast and the other to carry petroleum for fuel. The catamaran is being constructed so that it may be taken apart for transportation on the deck of a whaler.

### New 48-inch Radial Drill.

Among the new tools recently built by the Betts Machine Company, of Wilmington, Del., is the 48-inch radial drill which we illustrate on this page. The advantages of a radial over any other type of drill are too well known to need any ex-

planation here, and the superiority of a balanced spindle drill is also manifest, though probably not so familiar. The particular advantages of the drill here represented consist of the peculiar method of balancing the spindle with a double weight, thus equalizing the strain, the quick return and automatic feed, and the rapid movement to the spindle carriage, through a rack, instead of the usual method by means of a screw. The hand-wheels and clutches for the different movements are conveniently placed for the workman, and a locking device secures the carriage to the arm in any position. The cut represents the drill with a 48-inch radius, and having sufficient movement toward the column to cover a great range of work. It is arranged with a square hinged table, which is practically universal in all its movements and has a convenient clamping device to hold it rigidly in any position; if desired, other forms of table can be used. The

machine, as a whole, is calculated for doing a great variety of work with accuracy, convenience and rapidity.



FORTY-EIGHT INCH RADIAL DRILL.

Built by the Betts Machine Company, Wilmington, Del.

injector, but not sufficient to prevent the water from passing freely enough when it was merely poured into the pipe. As there was a bend at each end of the pipe the existence of the obstruction could not be seen.

The great increase in the weight of locomotives within a few years is illustrated by the fact that the Pennsylvania Railroad Company is turning out a large number of engines weighing 136,000 pounds empty, having a remarkably large boiler-heating surface. These immense machines are exceeded in weight by a few special engines on mountain roads, the heaviest being the "decapod" engines of the Northern Pacific, in use over the Stampede Pass, the total weight of which on drivers and truck is 148,000 pounds, while the entire weight of locomotive and tender in working order is no less than 228,000 pounds, or over 114 tons.

### The Sigua Iron Mines, Cuba.

T. H. Graham, of 400 Chestnut street, Philadelphia, has printed a pamphlet, "Description of the Cuban Bessemer Iron Ore Range," accompanied by a map, which is of considerable interest, since Mr. Graham was connected with the development of the well-known Juragua Iron Company, Limited, the joint property of the Bethlehem Iron Company and the Pennsylvania Steel Company. Mr. Graham speaks only briefly, but very strongly, of the Sigua or Arroyo la Plata properties so far as the mines proper are concerned. One of the six Sigua properties is described as showing outcrops varying from 150 to 450 feet in width, with a very large amount of ore in sight. They are located about four miles back of the Carribean Sea, about 22 miles by road from the Bay of Santiago de Cuba. Mr. Graham deals at length with three methods proposed as available for getting the ores out. He says:

"The first plan, and that which requires the least capital, is simply to construct five miles of railway to the roadstead at the mouth of the Sigua River and from that point to tow the ore in barges to the bay of Santiago de Cuba, which is about 20 miles distant. The second plan is to construct a basin for ocean going ships at the mouth of the Sigua River or at some other point on the coast convenient to the mines. The third plan is to construct a railroad 22 miles long, from the Sigua mines through the whole extent of the range to the bay of Santiago de Cuba. Given a great iron ore region within a distance of 4 miles of a tranquil sea and 22 miles by a railroad route of easy construction from one of the best harbors in the world, the question of transportation to tide cannot but be one easy of solution, and the method employed must necessarily depend upon the scope of the enterprise. The distance from Santiago de Cuba to New York is 1340 miles, and to Norfolk about 1100, so that ocean freights may be obtained under time charters, at from \$1.50 to \$1.75 per ton, and under chance charters at from \$1 per ton upward. Other conditions which influence the cost of mining and shipping these ores are as favorable as could be desired. The Government employs all means in its power to encourage and promote the mining industry in the Island of Cuba. Mining companies are, by a special law, exempted for a period of 20 years from all taxation, and for a period of seven years from import duties on all materials, machinery, &c., for use in the construction and operation of mining works. These exemptions cover railway, harbor and all other works belonging to mining companies. Labor is easily obtainable at the rate of 80 cents per day, and under proper management is very efficient. The climate in the hills where these mines are situated is healthy and delightful."

Summarizing Mr. Graham's tables of cost of the different plans, we have the following:

	Plan 1.	Plan 2.	Plan 3.
Plant—Railway sidings, &c. (5 miles)	\$130,000	\$200,000	\$750,000
Basin	.....	250,000	.....
Real estate	12,000	15,000	15,000
Franchises	10,000	10,000	10,000
Equipment	35,000	25,000	35,000
Surveys	10,000	10,000	10,000
Buildings, shops, &c.	30,000	35,000	35,000
Storage pier, Santiago Bay	75,000	.....	100,000
Tugs and barges	60,000	.....	.....
Administration and incidentals	35,000	45,000	45,000
Total	\$400,000	\$600,000	\$1,000,000
Add 25 per cent.	100,000	150,000	*100,000
Total	\$500,000	\$750,000	\$1,100,000
Capital required:			
Plant as above	\$700,000	\$750,000	\$1,100,000
Advance against royalties (say)	100,000	100,000	100,000
Working capital	150,000	150,000	150,000
Total	\$750,000	\$1,000,000	\$1,350,000

\*10 per cent.

Cost of ore in cars duty paid at New York, Philadelphia or Baltimore:

Mining	\$0.75	\$0.75	\$0.75
Royalty	.30	.30	.36
Transportation	.20	.15	.15
Rehandling	.30	.....	.....
Ocean freights	1.75	1.75	1.75
United States duty	.75	.75	.75
Administration and incidentals	.50	.50	.50
Per ton	\$4.55	\$4.20	\$4.20

After discussing in a general way the question of foreign ore supply, Mr. Graham says:

"To illustrate more fully the beneficial effect upon the iron industry of the South which would result from the introduction of Cuban ores, figures are given based upon the establishment of a works on the borders of the great Flat-top Coking coal field of Virginia. The locality has been selected for the purpose of illustration chiefly because the writer is more familiar with it. The same figures, with modifications, may perhaps apply to the regions of Tennessee, Georgia and Alabama. It is assumed that the low-priced native ores of the Cripple Creek Valley and from the mountains of Virginia and North Carolina would be utilized to the fullest extent compatible with good results in connection with the ores from Cuba. It is hardly necessary to add that the construction of a large furnace plant near the Flat-top coal field would stimulate the production of native ores accessible within the radius of 300 miles. The subjoined costs are computed for varying mixtures of Cuban and native ores made into pig iron at Radford, Va., on the line of the Norfolk and Western Railroad. The cost of the ores are placed at \$6.50 per ton and \$2 per ton for Cuban and native ores respectively. The cost of fuel, limestone, labor and incidentals is estimated as follows: For the production of one ton of pig—

1½ tons of coke at \$2.35, delivered	\$2.94
Limestone	.30
Labor	2.00
Incidentals and expenses	.50
Total	\$5.74

"Calculated in this way—i. e., allowing \$6.50 per ton for Cuban ore, and \$2 per ton for native ore, and adding \$5.74 per ton of pig, for the cost of fuel, limestone, labor and incidentals, the cost of one ton of Bessemer pig made at Radford, Va., would be as follows: When made all of Cuban ore, \$15.90 per ton; when made at the rate of 3 tons of Cuban to 1 ton of native ore \$14.54; at the rate of 1 ton of each, \$13.20; and with 3 tons of native and 1 ton of Cuban ore, the cost of 1 ton of pig would be \$11.59. These costs are calculated on the basis of a yield of 64 per cent. from the Cuban, and of 50 per cent. from the native ores. It should be observed that \$6.50 per ton, the price fixed for Cuban ore, allows for a profit of \$1.25 per ton and \$1 per ton for back freight from Norfolk. It should also be noted that the coke is marked at the highest market price."

Fairbairn's formula for the collapsing pressure of a furnace tube of ordinary dimensions is based on experiments with tubes, and is:

$$P = 806,000 \times \frac{T^2}{L \times D}$$

P being the collapsing pressure in pounds per square inch, L the length in feet, and T and D the thickness and diameter, respectively, in inches. For ordinary purposes, however, T is generally written as the square instead of the 2.19th power, the constant being increased to 806,300. A comparison of the formula, however, with the results of actual collapses of furnace tubes under ordinary conditions of working seems to show that it gives results much higher than those obtained under ordinary methods of construction and collapsed under steam pressure.

### The Interstate Commerce Law.—III.

#### PROHIBITION OF POOLS.

Pooling among railroads has yet some strong advocates among students of the problem, and its prohibition, it has recently been asserted, may jeopardize the other good results of the law. Did Congress, indeed, commit a tremendous blunder in breaking up our traffic pools? To answer this question impartially, let us go back a little. A railway pooling association had two objects—to fix and maintain the rates agreed upon, and to divide the tonnage or earnings in some agreed proportion. In pursuance of the first object, systems of railroads made up of individual roads joined together were brought into harmony and then diverse methods of transportation reduced by compromise. Classifications of freight differed from each other, as we might expect men's opinions to differ about disputed points; these were gradually brought to a common basis. In the matter of freight rates, also, the pools brought comparative uniformity and steadiness out of disorder. For these services the commercial public owes a debt of gratitude to the railway pools which should be heartily acknowledged. We say comparative steadiness, for, as the pooling agreements existed only by consent, cutting of rates and railway wars were always possible. With these facts in view, it has been said that the true solution of the matter lay in the legalization of pooling, the idea being that as the wrongs under that system arose from the inability of the pool to enforce its rules upon its members, once grant the pool power enough and unjust discrimination would cease. To this it may be said that the legalization of pools would carry with it the responsibility of Government for all the acts and rates of the bodies thus legitimized, and there is no doubt that appeals to Congress against pool acts and rates would be freely made, and the competition of city with city or section with section become an important matter in politics. It is a grave question whether there would be any stopping place between a national recognition of pools and such an oversight of transportation as would make Government ownership of railroads the only escape from our difficulties. In such a matter European precedents, except English, have really but little bearing upon the question, for reasons of differing forms of government, difference of conditions and because of our necessity for a freer development. It is in human nature to prefer a smaller volume of business to a larger at the same net revenue, and to this the public and not the stockholders are most opposed. But it will be objected here that rates have shown a constant lowering under the pool; would they not fall the same under a legalized pool? Too much credit is given to the old pools on account of this fact, for it is true that many if not most of the reductions were in spite of the pools, and not through their operation. Had these old pools been legalized, would we have had such reductions? Could we be sure, under an iron pool, that future cheapening of cost would proportionally reduce rates? These are fair questions.

To the second purpose of the pool, the division of earnings, there are strong objections. The earnings as apportioned represented not the capacity of the weak road for traffic at strict rates, but its capacity for mischief. How much was it advisable to pay rather than break up the tariff, was the real question. Hence, the more money spent by a good line upon its service, the less its return proportionally, and hence, also, a certain slacking of enterprise. The public are selfishly anxious that the lines which render the best service should have their reward in increasing traffic and profits. To this it is replied



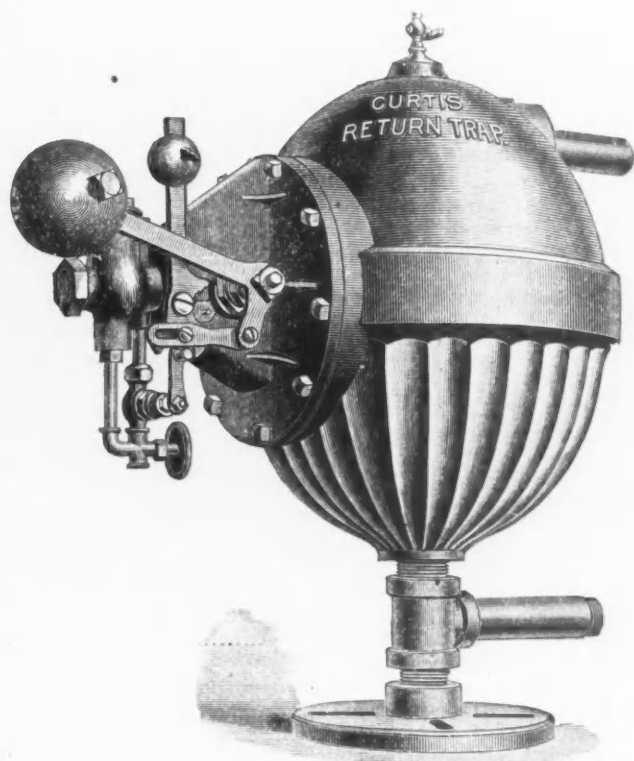
that the roads competed among themselves for the largest share of the pool traffic. It is, however, not a correct use of the word competition to apply it merely to a division of the traffic at fixed rates. To be rightly so-called competition should affect rates and service directly. We have taken a step in this direction by the recent differentials through which the Pennsylvania and the New York Central allow the other trunk lines to reduce their rates. Thus, we reach a pool result—a division of the traffic—by more natural methods, and make the lower rate a compensation for inferior service. The differential plan is capable of great development. But competition must not be allowed to degenerate into war. The former is the life of trade, the latter is its destruction. If we must choose between disastrous railway wars and pools, then let us have pools, though it is to be hoped that we may not

amalgamation or co-operation would not be entirely absolute as to charges. Our sea and inland coast lines are too extensive for that, but relatively it would be so and as powerful as government itself. If the weakness of a pool is a menace to business, its strength might become no less dangerous.

#### The Improved Curtis Return Steam Trap.

The Curtis Regulator Company, 59 Beverly street, Boston, Mass., have recently effected a decided improvement in their automatic return steam trap. Its nature will be understood at once from the engraving which we annex.

In the old form of trap the exterior working mechanism, as may be remembered, was placed on top, and the trap



IMPROVED CURTIS RETURN TRAP.

Made by the Curtis Regulator Company, Boston, Mass.

be limited to the choice of either of them. It should be remembered that pools are not an end, but means toward that end, and it is now the question whether in the evolution of transportation we have not got beyond them. The end to which all this machinery and legislation is directed is, uniformity within necessary limits, steadiness which shall not be arbitrary, but shall change slowly and naturally as trade changes, and such competition as can be reconciled with the right of each individual and each locality to fair and equal treatment—all this with full acknowledgment of the good results accomplished by the old pools. Any law prohibiting pooling, in order to protect both railroads and merchants, must compel publication of tariffs, and contain the long and short haul restriction in some form. Without these sections the prohibition of railway pools would only invite disaster.

Might we not have abstained from legislating regarding railway pools? Yes, but by so doing we would have postponed the problem, not solved it. Every one must have noticed the growing strength of pools while railroad men were looking forward to the time when there should be a combination of those existing. Such a gigantic

itself was made in halves suitably bolted together. In its present shape an opening is made in the side of the trap body, of sufficient size to admit the float. The valve gear and rotating spindle which connects the float to the outside spindle are all arranged on the cover of this side opening so that when this cover is removed nothing is left except a plain casting. A tripping lever has also been added, which operates when the end of the stroke has been reached. This lever is weighted at its upper end, and is so proportioned that it falls a short distance before it strikes the crank on the valve stem, thus knocking the valve from or against its seat, as the trap fills or empties. The float thus has nothing to do but trip the lever, which positively opens or closes the valve, at the end of each stroke. The whole valve gear is on the outside, and can be readily removed for repairs without disturbing the pot or piping. The action of the trap is precisely like that of the old form of Curtis return trap. The water rising raises the float, which, at the proper moment, operates the valve, letting full boiler pressure on to the surface of the water in the trap. A check-valve on the inlet pipe prevents its return to the receiver.

#### The Competitors of the Connellsville Coke Region.

The iron and foundry trades of the United States have taken a deep interest in the rapid growth of coke-making in districts outside of the Connellsville region, since the course pursued by the producers of that section, and by its workmen, has caused serious embarrassments during the last year, not taking into consideration the evident determination of the Connellsville interest to force prices to the highest possible point, and their short-sighted determination to keep them there. The impetus given to investments in coal property and coke plant has been particularly marked during the past year. So far consumers have been afforded little relief through this competition. There can be no doubt that outside competition has affected the sale of Connellsville coke in the East, but furnacemen have reached the conclusion that most of the coke from other districts is not equal in quality to the standard fuel, and that the slight difference in price—from 10 to 15 cents per ton—has not been sufficient to offset poor work in the furnace. Thus far the outside producers have followed syndicate prices, up and down, and they have added to the price whatever difference there has been in their favor in the way of freights. A similar state of affairs has existed, so far as the Western trade is concerned, with the coke producers of different West Virginia districts, the matter being complicated there by the fact that the railroad companies and the operators have generally been engaged in the struggle as to who should get the greatest benefit of an advance. They have coal agents in the West whose business it is to ascertain the prices obtained, so that the rate of freight may be advanced as prices increase. At one time, three years ago, one of the railroads serving the West Virginia coke regions made a general reduction in rates of freight to a new territory in the West which they wished to reach, with the understanding that the operators were to make a reduction also. The result was that in a very short time the business had increased to such an extent that the demand for New River coke was very much in excess of the supply, whereas when it was initiated the supply was considerably greater than the demand. From that time the consumption has been so much ahead of the output that both operators and railroads have been able to give a large advance on their ordinary rates. The Chesapeake and Ohio carry to market coal and coke from the northeast end of the New River coal field, where the vein runs about 4 feet, and the Norfolk and Western carry coal and coke from the southwest end, where the vein runs from 11 to 12 feet. The latter are very much further from the Western market, but, like the Chesapeake and Ohio, have some furnaces on their line. The Norfolk and Western have pursued a more liberal course with their operators, giving them low rates of freight, and adhering to their rates without showing a disposition to reduce the prices of coke. The result of the development on the Norfolk and Western has been more rapid than on the line of the Chesapeake and Ohio, though the former has only been carrying on the business for about one-half the time that the latter has been at work, and it is estimated by good authority that their output will probably exceed the make within the next 12 months.

It may be questioned whether the policy thus far pursued by outside operators, and to some extent by the railroads serving them, can be adhered to when the time arrives for the inevitable contest between the Connellsville producers and outside operators. The former have also largely

increased their working capacity during the year 1887, as has been shown by the compilation recently published in *The Iron Age*. The questions at issue are of such momentous importance to the iron trade and allied industries that we have made an effort to obtain, so far as practicable, a statement of all the manufacturers of coke outside of the Connellsville region, who may be considered as fairly being competitors either for Eastern or Western business. We cannot claim for this compilation that it is complete, but it will help consumers to estimate more closely the capacity of the different sections, and will prove to them that at a price, which they may soon be in a position to have a voice in naming, they can obtain supplies of fuel from other quarters.

#### Pennsylvania.

In 1886, according to official statistics, the total number of ovens in Pennsylvania was 16,314, of which 11,324 ovens were in the Connellsville district proper, leaving nearly 5000 ovens in other parts of Pennsylvania. These, however, did not make the impression upon the market which their number would seem to warrant, since a good many are controlled by iron manufacturers who use the product for their own purposes, and rarely enter the open market.

In the Greensburg district are the following operators, old and new:

#### Greensburg District.

	Ovens January 1, 1887.	Ovens built in 1887.	Total ovens.
Greensburg Coal Company, Greensburg....	10	..	10
Carbon Coal Company, J. C. Clarke, treasurer, Greensburg; David E. Williams, president, 333 Walnut street, Philadelphia.....	..	25	25

We understand that the Carbon Coal Company contemplate increasing the number of their ovens to 100.

In the Irwin-Latrobe district there has been much activity.

#### Irwin-Latrobe District.

	Ovens January 1, 1887.	Built in 1887.	Total ovens.
Pennsylvania Gas Coal Company, J. M. Wolf, superintendent, Irwin..	50	..	50
M. Saxman, Jr., & Co., Latrobe.....	60	..	60
Derry Coal Company, M. Saxman, Jr., presi- dent (to build 200) ...	..	50	50
George Bigley, lessee, Alpsville.....	20	..	20
Carnegie, Bros. & Co., Larimer.....	300	..	300
Stoner & Co., Limited, Eureka Mines, Pitts- burgh.....	18	..	18
Waverly Coal and Coke Company, Smithton..	117	..	117
Latrobe Coal Company, Latrobe.....	80	20	160
H. C. Frick Coke Com- pany, Monastery....	208	..	208
Isabella Coke Company, Blairsville.....	216	35	251
Loyalhanna Coal and Coke Company, Loyal- hanna.....	244	..	244
Ridge View Coke Com- pany, Badenville....	57	..	57
St. Clair Coal and Coke Company, Limited, Badenville.....	128	..	128
Blairsville Coke Com- pany, Blairsville....	21	..	21
Lockport Works, Lock- port (building) .....	..	..	200
Total .....	1,519	103	1,624

In the Allegheny Mountain and Somerset districts we enumerate the following producers:

#### Allegheny Mountain and Somerset.

	Ovens Jan. 1, in 1887.	Built 1887.
Bennington Coke Works, Cambria Iron Company, Hollidaysburg..	100	..
East Conemaugh, Cambria Iron Com- pany, Johnstown .....	65	30
Cumberland and Elk Lick Coal Com- pany, A. Chamberlin, Sup't, Meyers- dale.....	50	25
Gallitzin Coal and Coke Company, Tyrone. J. L. Mitchell, Treasurer..	100	72

Glen White Coal and Coke Company, Glen White.....	80	..
Altoona Coal and Coke Company, Horse Shoe.....	56	..
Aaron Leahy, Hemlock.....	37	..
W. H. Piper & Co., Lilly's Station, office 413 Walnut street, Phila.....	20	..
Cresson and Clearfield Coal and Coke Company, Cresson.....	..	..
Consumers' Coal and Coke Company, Portage (Cambria County).....	..	..

The Cumberland and Elk Lick Coal Company, of Meyersdale, have added 25 ovens to their plant, of 50 during 1887. The Cambria Iron Company, who have 600 bee-hive ovens in the Connellsville region, 100 ovens of the same kind at Bennington, 29 miles east of Johnstown, and 65 Belgian ovens at East Conemaugh, 2 miles east of Johnstown, are building 30 additional Belgian ovens at East Conemaugh. The Gallitzin Coal and Coke Company, of Tyrone, built 72 ovens during the year 1887. W. H. Piper & Co. did not add to their plant during the last year, but they contemplate an addition of 100 ovens in 1888. Two new companies have started in the district, the Cresson and Clearfield and the Consumers' companies, from which details have not been received.

In the Snow Shoe or Clearfield-Centre district there has been considerable activity in new construction.

#### Snow Shoe or Clearfield-Centre District.

	Ovens January 1, 1887.	Built 1887.	Total number.
Irvona Coal Company, W. J. Nicolls, treas- urer, 216 South Third street, Philadelphia; ovens at Coalport....	80	20	100
Lehigh Valley Coal Com- pany, W. A. Lathrop, superintendent, Snow Shoe, Centre County..	165	100	265
R. B. Wigton & Sons, Phillipsburg; ovens at Morrisdale.....	60	60	120
Clearfield Bituminous Coal Corporation, R. A. Shillineford, super- intendent, Peale, Clear- field County.....	..	100	100
Wallace & Wrigley, Clearfield; ovens at Alder Run Colliery, near Wallaceport....	..	30	30
Clearfield Creek Coal Company, Pine Run..	..	50	50
R. C. Fishburn, Tyler Mine, Munson Station	30	20	50
Totals.....	335	280	715

It will be observed that the number of ovens in this district has more than doubled. The Irvona Coal Company, in their letter to us, make special mention of the low phosphorus in their coke. The Lehigh Coal Company quote the following analysis of their coke made by Booth, Garrett & Blair, of Philadelphia, from a sample selected by the analysts: Moisture at 212°, 0.36; volatile matter, 0.46; fixed carbon, 90.27, and ash, 8.9 per cent. The ovens of R. B. Wigton & Co. are situated at their Morrisdale No. 3 Colliery, on the Beech Creek Railroad, coking the Moshannon bed, which is the D or Freeport coal. The ovens of Wallace & Wrigley are located at the Alder Run Colliery, on a short branch of the Beech Creek Railroad. Senator Wallace, who is interested in this firm, controls also the new plant of the Clearfield Creek Coal Company, at Pine Run, on a short branch of the Tyrone and Clearfield Railroad, where the company control about 5000 acres of land. They are working a 5-foot vein of coal, and, in addition to coke, ship raw coal for the Moshannon oven. The Clearfield Bituminous Coal Corporation coke the B bed in ovens 12 feet in diameter and 6 feet 3 inches high in the clear. The coal is the same bed as is known at Bennington as the Millar seam. R. C. Fishburn furnishes us with the following analysis of his coke, made by Booth, Garrett & Blair: Moisture at 212°, 0.124 per cent.; volatile matter, 0.346; fixed carbon, 90.73, and ash, 8.8 per cent. All of the companies named ship their product to market via the Beech Creek Railroad, with the exception of the Lehigh Valley Coal Company, which ships via the Pennsylvania Railroad.

There is but little to note in the Broad Top district, with the following plants:

#### Broad Top District.

	Ovens January 1, 1887.	Built in 1887.	Total number.
R. B. Wigton & Sons, Cu- nard.....	18	..	18
Everett Iron Company. Everett.....	110	..	110
Kemble Iron Company, Riddlesburg, W. Lan- der, general manager R. Hare-Powel's Sons & Co.: Powelton (bee-hive) ...	88	..	88
Saxton (Belgian) ...	106	50	156
Rock Hill Iron and Coal Company, Orbisonia..	56	6	62
184	..	184	
Totals.....	592	56	648

Practically all of the coke made in this district is produced by iron companies for their own use. Messrs. R. Hare-Powel's Sons & Co. write us in regard to the question of bee-hive *ex. Coppée* ovens: "We find after a varied experience of four years that the bee-hive is better as regards quality of the coke, as the method of cooling the Belgian oven enforces the use of so much water that the moisture is a great deal more in this coke than in the other. Otherwise we have a good opinion of the Belgian ovens, as they can make coke cheaper and we think almost as good quality as the other oven." Mr. W. Lander quotes the following analysis of Kemble coke: Carbon, 89.13 per cent.; ash, 10.74; moisture, 0.13 per cent. Their general charge is 8000 pounds, yielding 5000 pounds of 48-hour coke. When running, the ovens of the Everett Iron Company produced 2.3 tons of coke per oven drawn.

The following are the producers in the Pittsburgh district:

#### Pittsburgh District.

	Ovens January 1, 1887.	Built in 1887.	Total number.
Jonathan Allison, Washington.....	4	..	4
John Carlin & Co, Pitts- burgh.....	16	..	16
Morris McCue, Cherry, Pittsburgh.....	8	..	8
Ethel Coke Works.....	20	..	20
Fort Pitt Coal Com- pany, J. E. McCrickart, manager, idle (three years).....	16	..	16
Imperial Coal Co m- pany, W. McCreery, president, Pittsburgh.	60	42	102
Jumbo Coal and Coke Company, F. L. Rob- bins, secretary, Pitts- burgh.....	16	..	16
Laughlins & Co., Pitts- burgh.....	56	..	56
W. P. Bend & Co., Laurel Hill.....	31	..	31
Mansfield Coal and Coke Company, Pittsburgh	22	..	22
Pennsylvania Salt Mfg. Company, Natrona....	10	..	10
Jas. Y. Cochran, Pitts- burgh.....	8	..	8
R. C. Schmertz & Co., Pittsburgh.....	9	..	9
John Robson & Son, Pittsburgh.....	47	6	53
W. Stoner's estate, Pittsburgh.....	5	..	5
Sanford Coke Company, Essen.....	..	100	100
Totals.....	328	146	474

The only point of interest is that the Sanford Coke Company are building a 100-oven coke plant at McKees Rocks, on the Ohio River, 4 miles west of Pittsburgh, to use the slack from the mines on the P. C. and Y. Railroad.

#### Beaver District.

	Built January 1, 1887.	Built in 1887.	Total number.
James Clayton, Beaver Falls.....	3	..	3
W. H. Clayton, Beaver Falls.....	4	..	4
Raney & Berger, New- castle.....	80	..	80
Lee & Patterson, New- castle.....	20	40	60

#### Allegheny Valley District.

	Built January 1, 1887.	Built in 1887.	Total number.
Union Coal and Coke Company, Coaltown..	50	..	50
Kittanning Iron Com- pany, H. A. Colwell, secretary, Kittanning.	66	..	66
Pittsburgh and Fairport Coal and Coke Com- pany, W. C. Mobley, general manager, Roy Red Bank Furnace Co., Red Bank.....	50	..	50
42	..	42	



*Blossburg District.*

Blossburg Coal Comp'y,			
Arnot .....	250	..	250
Fall Brook Coal Com-			
pany, Tioga .....	96	..	96

It will be observed that there have been few changes in the districts enumerated together in the above. The following section, the Reynoldsville Wallston district, has, however, been the scene of much more activity.

*Reynoldsville—Wallston District.*

Rochester and Pitts-			
burgh Coal and Iron			
Company, J. A. Has-			
kell, gen'l manager,			
Wallston:			
Wallston .....	500	300	700
Adrian .....	260	190	450
Bell, Lewis & Yates			
Coal Mfg. Company,			
Buffalo, N. Y.:			
Reynoldsville .....	..	..	64
DuBois .....	..	..	56
Cameron Iron and Coal			
Company, J. Hunt,			
gen'l manager, Cam-			
eron, building .....	..	..	100
Williams Run, near			
Punxatawney, E. J.			
Berwind, New York ..	..	50	50
Clearfield Coal Comp'y,			
Tyler, E. A. Foster,			
supt. ....	30	70	100
Northwestern Mining &			
Exchange Company,			
D. Robertson, supt.,			
Dagus Mines .....	36	..	36
Fairmount Coal & Iron			
Company, Fairmount			
City .....	30	..	30
Northwestern Coal and			
Iron Company, Fair-			
mount City .....	30	..	30
Frankhurst Wister			
Mines, Frankhurst ..	..	100	100
Powers, Brown & Co.,			
Reynoldsville .....	62	..	62

The Rochester and Pittsburgh Company now have 1150 ovens running; the Clearfield Coal Company have 100; the Cameron Iron and Coal Company are building 100; and the Caledonia Coal and Coke Company, of Penfield, control territory exceeding 25,000 acres, and have been developing it during the year. They are credited with the intention of building a large number of ovens at an early date. The Williams Run property, in which the Berwinds are interested, is on the recently completed Clearfield and Jefferson Railroad. The first 50 ovens built by them are completed, and it is not yet determined how much additional plant will be put up. At Horatio, on the Mahoning River, in Jefferson County, a number of coke ovens are being built, and on the South Witmer branch, extending from Irvona westward to the Frankhurst Wister mines, 100 ovens have been put up.

*West Virginia.*

In West Virginia coke production has been greatly stimulated during 1887. Turning first to the New River District, we have the following operators:

*New River District.*

	Built January 1, 1887.	Built in 1887.	Total number.
Nuttallburg Coal and			
Coke Company, Nut-			
tallburg .....	61	5	66
Joseph Lawton & Co.,			
Fayette .....	12	..	12
Beury Coal and Coke			
Company, O. C. Ku-			
bach, General Man-			
ager, Stone Cliff Co.			
Fire Creek Coal and			
Coke Company, F.			
Howard, Supt., Fire			
Creek .....	96	..	96
New River Coke Com-			
pany, F. Howard,			
Supt., Caperton .....	..	150	150
Thomas & Lomax,			
Hawk's Nest .....	..	18	18
Longdale Iron Com-			
pany, Longdale, Va.,			
ovens at Sewell (Coke			
for own use .....	130	30	150
Quinnimont Coal and			
Iron Company, Quin-			
nimont .....	82	7	89
W. Beury, Cooper &			
Co., Caperton .....	50	..	50
Gaymont Coal Com-			
pany, Joseph Per-			
run, Hawk's Nest .....	32	..	32
Central Coal Company,			
Fire Creek .....	..	..	..

Slater Creek Coal and			
Coke Company, Coit.			
Beechwood Coal and			
Coke Company, Stone			
Creek .....	..	..	..
Total .....	513	210	728

It will be noted that there has been considerable increase in the capacity. Roughly, the capacity of the ovens is rated at about 1 ton per day.

In the Kanawha district we have the following:

*Kanawha District.*

	Ovens January 1, 1887.	Built in 1887.	Total number.
W. Wynant, Eagle	45	..	45
Great Kanawha Colliery			
Co., Limited, Syming-			
ton Macdonald, Man-			
ager, Mount Carbon			
(building 20 more) ..	36	30	66
St. Clair Co., Eagle	60	18	78
East Coalburg, S. M.			
Buck, Coalburg .....	6	..	6
Crescent, W. R. John-			
son, Crescent (30 more			
building) .....	..	30	30
Mount Carbon Co., Lim-			
ited, Wm. N. Page,			
Gen. Manager, Powel-			
ton .....	100	102	202
Hawk's Nest Coal Co.,			
Ansted, Copper .....	60	20	80
Total .....	307	200	507

In addition to those enumerated, 50 more are building, and there have been a number of projects.

Speaking in a general way on the conditions affecting the New River and Kanawha coking districts a correspondent says:

So far as competition with Connellsville goes, I believe that New River will be fully up to the standard and in many cases will be ahead, but, when the freight rates are equal, Connellsville will have the advantage in cost. The New River seams are generally thin, but the work is being extended into an area of thicker coal. At present and for years past the average thickness of coal in some of the largest mines has been below 36 inches. This, of course, affects both price of mining proper and of dead work. Miners are now paid 50 cents per ton, and \$1 per ton on railroad cars may be taken as the minimum. Considering the heavy expense of building and maintaining the long gravity planes on the steep hillsides and cliffs, this is not high. The coke oven plant is expensive on account of the heavy cutting and blasting. The above will indicate a cost of, say, \$2.16 for coke, without allowing for contingencies. In the Kanawha district the coals are different and vary much among themselves in their inherent composition and in the accidental presence of sulphur and ash. The growth of the Kanawha coke production has also been rapid, though some of the enterprises have been ill-advised. When the run of mine is coked the Kanawha district will have no advantage in cost compared with New River, the coal being harder to mine; but there will be some slight advantage in freights, helping to balance the present disadvantage in reputation under which Kanawha coke labors. When the slack alone can be used, there is, of course, more margin, and in some instances, at the same time, an improvement in quality. When the ash is only 9 per cent. and sulphur 0.5 per cent., a little brittleness may be forgiven.

Turning to the Northern district we have the following data:

*Northern District of West Virginia.*

	Ovens January 1, 1887.	Built in 1887.	Total number.
J. T. Farland, Clarks-			
burg .....	20	30	30
(Ovens torn down and			
rebuilt.)			
Howard Coal and Coke			
Co., Wilsonburg .....	30	20	50
Harrison County Coal			
and Coke Company,			
W. H. Freeman, secre-			
tary, Clarksburg .....	6	10	16
Despard Coal Company,			
Clarksburg .....	18	..	18
F. Nemegyei, Irondale			
51 .....	51	..	51
Austen Coal Works, C.			
Jessop, agent, Austen			
Manchester Coal Com-			
pany, Wheeling .....	65	12	77
Newburg, Wheeling			
Company, Orrel Coal			
Company, Baltimore:			
Newburg, Preston			
County .....	105	..	105
Tyrconnell, Taylor			
County .....	45	..	45
Montana Coal and			
Coke Company,			
Judge A. B. Flem-			
ing, Fairmont .....	20	140	160
(Expect to build 50			
to 100 more.)			
Gaston Gas Coal Com-			
pany, Judge A. B.			
Fleming, Fairmont ..	..	30	30

New England & Western			
Coal Company, Fair-			
mont, building .....	..	..	200
Britton Coal and Coke			
Company, D. Britton,			
Fairmont, building:			
At Clements .....	50	..	50
At Britton .....	50	..	50
At Opekiska .....	25	..	25
Totals .....	348	242	895

There has been a good deal of activity in the vicinity of Fairmont, though but little is known in regard to it by the public generally. The Montana Coal and Coke Company are located five miles below Fairmont, on the Upper Monongahela River, while the Gaston Company are two miles above that point, on the West Fork River. The latter company were organized several years since, and ship from 60,000 to 80,000 tons of gas coal yearly, but it was only during the past summer that 30 ovens were erected for the purpose of burning the nut coal. The Britton Company are composed of Philadelphia parties, who have completed 100 ovens, built during the summer. The New England and Western Coal Company began the construction of 200 ovens, but, without completing them, suspended work for the season.

An exceptionally rapid development has taken place during the year 1887 in the Flat Top district, which in 1886 was credited with two works having 10 ovens, with 38 building, and a coke product of 658 tons.

	Built.	Build- ing.
Southwest Virginia Improvement		
Co., Pocahontas .....	300	..
Mill Creek Coal and Coke Co. ....	150	..
Caswell Creek Coal and Coke Co.,		
Freeman & Jones, Freeman's		
(contemplate 20 more, ..	70	30
William Booth & Co., Bramwell .....	66	..
Stephenson, Mullin & Co., Free-		
man's .....	56	..
Robert Goodwill & Co., Bramwell ..	50	..
Turkey Gap Coal and Coke Co.,		
W. H. McQuail, president, Coopers		
Elkhorn Coal and Coke Co., Coopers		
Robertson & Barlow, Coopers .....	..	100
John Cooper & Co., Coopers .....	..	100
Shamokin Coal and Coke Co., Bram-		
well .....	..	100
Crozier Coal and Coke Co., Bram-		
well .....	..	100
Cooper, Albortson & Co. ....	..	100
J. H. Bramwell & Co. ....	..	100
D. F. Houston & Co., Bramwell ..	..	106
R. A. Hecksher & Co. ....	..	150
Totals .....	692	780

The total of ovens building, noted as above, does not include the four concerns from which we have no figures direct or indirect. It is stated, however, that there are 600 ovens going up at Coopers alone. This would indicate a total of ovens building of at least 1000. In addition thereto there are 150 ovens building on the Flipping Creek branch and arrangements are being made on the Elkhorn for 200 additional ovens. The product from Coopers and the Elkhorn River will become available as soon as the branch of the Norfolk and Western Railroad is completed.

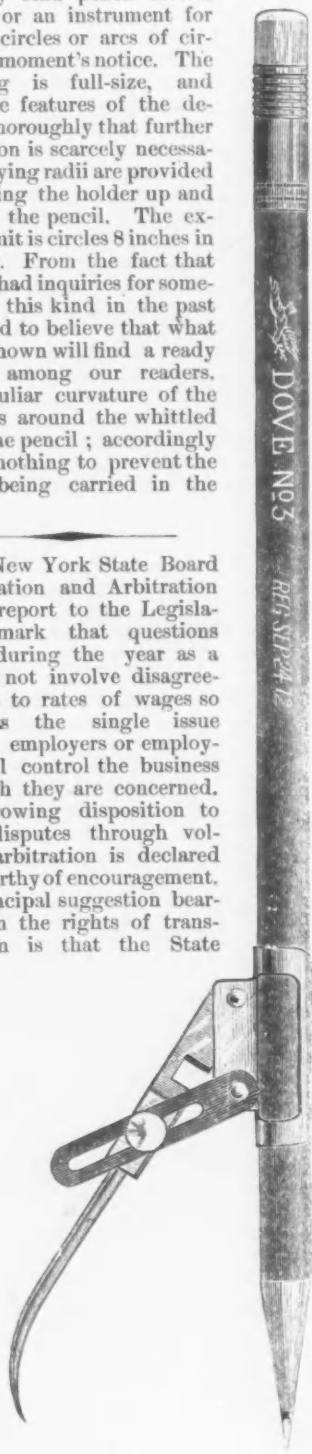
Concerning the excellence of the Flat Top coke there is no doubt whatever. It has found a ready market, both South and West, and thus far may be regarded, so far as quality is concerned, as the most formidable rival of the Connellsville coke.

The Governor of Iowa, in his annual message to the Legislature, says that the number of coal mines in that State is 515. The output of coal in 1886 was 3,853,372 tons; in 1887 it was 4,014,490 tons, an increase of 161,118 tons. During the two years there were thirty-eight fatal and eighty-two non-fatal accidents. The greatest number of men employed at one time was about 11,000. The inspectors estimate the amount of capital invested in the mining interests of the State at \$9,487,125. The absence of strikes indicates harmonious relations between operators and miners—relations which it is hoped may be continued without interruption. The increasing demand for coal, with better transportation rates, promises activity and prosperity for this important and growing branch of industry.

### Pencil Compass.

The Tower Mfg. Company, corner Broadway and Duane street, New York City, are directing the attention of draftsmen and users of lead pencils in general to a new device shown herewith which converts any lead pencil into a compass or an instrument for drawing circles or arcs of circles at a moment's notice. The engraving is full-size, and shows the features of the device so thoroughly that further description is scarcely necessary. Varying radii are provided by slipping the holder up and down on the pencil. The extreme limit is circles 8 inches in diameter. From the fact that we have had inquiries for something of this kind in the past we are led to believe that what is here shown will find a ready demand among our readers. The peculiar curvature of the point fits around the whittled end of the pencil; accordingly there is nothing to prevent the article being carried in the pocket.

The New York State Board of Mediation and Arbitration in their report to the Legislature remark that questions arising during the year as a rule do not involve disagreements as to rates of wages so much as the single issue whether employers or employees shall control the business in which they are concerned. The growing disposition to settle disputes through voluntary arbitration is declared to be worthy of encouragement. The principal suggestion bearing upon the rights of transportation is that the State



Compass Attachment for Lead Pencils.

should lodge somewhere a power, with ample means of law to make its intervention effective, for the speedy settlement of all disputes between the officers of railroad corporations and operatives of railroad property.

### Lightning Ice Cream Freezer.

The Shepard Hardware Company, Buffalo, N. Y., are putting on the market a new freezer which they call the Lightning. It is illustrated in the accompanying cuts, Fig. 1 giving a general view of the freezer, Fig. 2 showing more fully the method of its construction, and especially the mechanism by which the can is rotated, and

Fig. 3 representing the style of the dasher used. Special attention is called to the dasher which has a scraper made of wood, the purpose of which is to force the cream



Fig. 1.—The Lightning Freezer.

in the can from the center to the circumference, and has also a revolving dasher shown on the right, Fig. 3, which in turning is referred to as forming a vacuum in



Fig. 2.—The Lightning Freezer, Showing Construction.

the freezing cream from the top to the bottom of the can, which fills with air and is beaten in to the cream, making, it is claimed, very light and palatable, and mate-

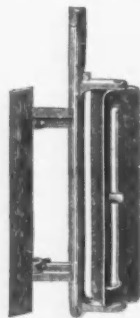


Fig. 3.—Wheel Dasher.

rially increasing the quantity put in the can. The convenience of the hinged top is also to be observed, as well as the fact that all the gearing is covered and protected, as

shown in Fig. 1. The fact that the tub is made extra large and of the best quality of cedar and bound with galvanized hoops is also mentioned. The point is also made that the can can be revolved after the dasher has been removed, if desired. This freezer is put on the market with special claims as to its efficiency and as to the quality of the cream produced by it. The excellence of the workmanship and material are also alluded to. It is made in 2, 3, 4, 6, 8, 10 and 14 quart sizes. Information in regard to the prices is given in the Trade Report.

### Automatic Guest Call.

Figs. 1 and 2 of the engravings represent a device which is being put upon the market by the Harford Electrical Company, of East Saginaw, Mich. It is a combined clock and automatic guest call, intended for use in hotels, and being an assurance of safety in the event of fire breaking out. The system is also adapted for use, with certain modifications, in private houses.



Fig. 1.—Combination Clock and Automatic Guest Call, for Hotels.

The apparatus of the system consists of the usual office clock and electrical annunciator and a switch-board showing room numbers. These are placed in the office of the hotel. The switch-board, as shown by Fig. 2, is mounted in cabinet-work of a character to make it an acceptable addition to the furnishing of any hotel office. It is compact, and any available wall space may be utilized. In each room of the hotel there is placed a common push button, and also an electrical bell. The batteries are located in the cellar or in a convenient closet. Referring to the cut of the switch-board and annunciator, it will be seen that the switch-board is arranged with a row of figures across the top, which represent the rooms and with hours of the morning commencing at 1.30 down the side. Each vertical row of holes then relates to a room, and each horizontal row to a period of time. For example, if a pin is put into the hole representing the intersection of the vertical row marked 5 and the horizontal row marked 5.30, it would mean that room 5 is to be called at 5.30. So much for the means to be employed by the clerk or person in attendance; further than this the mechanism is automatic. Suppose, for example, several guests are to be called at 5 o'clock. All that is necessary for the clerk to do is to insert pins in the room numbers on the switch-board opposite 5 o'clock. Suppose other guests are to be called at 5.30, the



pins are inserted in the respective room numbers of these guests opposite 5.30, and so on for such other calls as are desirable. Any number of rooms can be called at any or all of the whole or half hours, as may be desired. No further attendance need be given to the matter, for when the hour hand of the clock reaches 5 all the rooms switched on to that hour have their electric bells rung automatically. This ringing continues in each case until the guest arises and touches his push button; this has the effect of dropping the annunciator and indicating in the office that he has arisen. The clerk then removes the pin from the room number of the switch-board and thus stops the ringing or he can leave it there, since the bell will cease to ring automatically in from one to four minutes, according to the time for which it had been set. In addition to this the apparatus affords

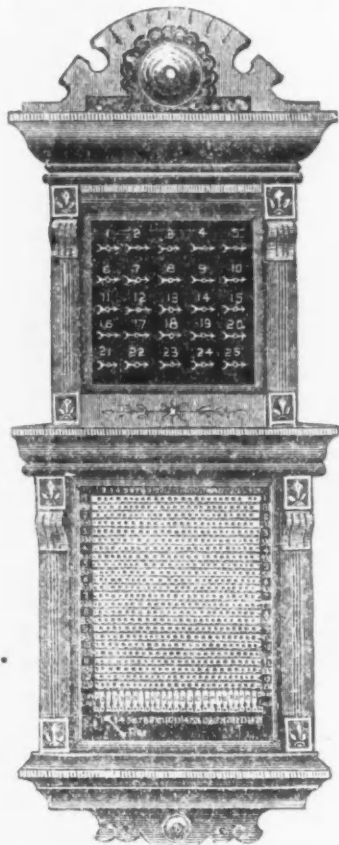


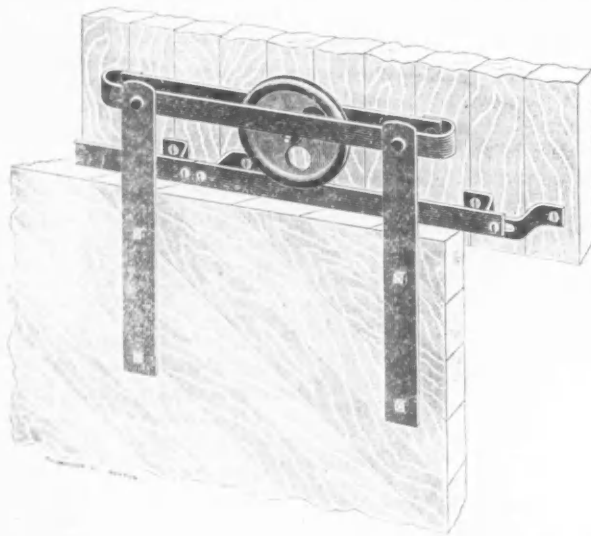
Fig. 2.—General View of Switch Board and Indicators.

the means of ringing a bell in any room at any time by simply pressing on a spring numbered to correspond with the room. In the event of fire, or when a general alarm is necessary, the clerk or other person in charge has simply to push over a lever, which is immediately caught and held fast, thus instantaneously and simultaneously ringing all the bells in the rooms. These will continue ringing until the lever is released. We are informed by the company that the annunciator operates the same as it ordinarily does when not connected with this system, and that annunciators already in place can be employed with this system at very small expense.

#### The Moody Steel Anti-Friction Barn Door Hanger and Rail.

This article, the invention of Mr. Moody, of the Victor Mfg. Company, Newburyport, Mass., by whom it is manufactured, is illustrated in the engraving given herewith. It will be seen that it belongs to the class of hangers designed to run on the edge of iron when either attached to the beam over the door or to brackets.

The hanger frame is described as made entirely of steel, and the wheel has a steel axle. It is alluded to as strong, simple and easily applied, and may be used as a sheave for the bottom of the door if desired. The special features of novelty are, however, in the rail, which has in combination with its brackets a positive lock joint to prevent the rail from getting out of line, either on its horizontal or lateral plane. The slot-hole bracket permits two



The Moody Steel Anti-Friction Barn Door Hanger and Rail.

lengths to be bolted to it, thus forming a perfect straight line, and the point is made that with this construction there is no possibility of displacement, a result that is not assured where rails attached to separate brackets abut. In attaching the brackets are put up 1 foot apart on centers when the rail is put up in place, the rail being secured to the bracket by  $\frac{3}{4}$  x  $\frac{1}{4}$  inch bolts. The slot-hole in the bracket allows, it will be perceived, a range of adjustment. This hanger and rail are put on the market to meet a demand for a bracket track hanger of moderate cost, but they are not recommended by the company as highly as their well-known Victor hanger and rail. Information in regard to the prices is given in the Trade Report.

#### Situation at the Troy Steel Works.

A correspondent at Albany writes us: Business men generally in Troy, and particularly those retailers doing business in the southern part of the city, are not a little disturbed just at present over the situation at the Troy Steel and Iron Company's works. In the great majority of the labor troubles throughout the country wherever large bodies of workmen have struck or been thrown out of employment for any length of time the small retail merchants dependent upon the patronage of the working classes suffer fully as much as the unemployed work-people, and oftentimes suffer even more. The latter almost invariably carry monthly or fortnightly accounts, and when, after the sudden stoppage of wages, the small merchant finds himself with an accumulation of uncollectable bills on his hands he is frequently driven to the wall. At present the outlook at the works is by no means promising. The employees have declined to accept the proposition made by the company to start all departments at a reduction of 10 per cent., and preparations are going steadily forward for shutting down the works indefinitely. Aside from the loss to the men employed and those merchants directly dependent upon them, the closing of the works will strike a severe blow at the business interests of Troy. The company have a capital stock of \$2,500,000, and the

yearly business of the works amounts to about \$5,000,000. The number of men employed is, in round numbers, 2500. The company's reason for asking the men to accept a reduction and ordering a shut-down upon the men's refusal was that there had been no money in the business for the past year. The cost to manufacture steel rails was \$34 per ton, the best the company could do, and the market price was about the same height, with a

prospect of a reduction before an advance. Vice-President Kemp, of the company, said one day this week: "It is absolutely necessary that a reduction of 10 per cent. in wages should be made to enable us to run without losing money. This is no fight between the company and the men. We have made no proposition to look for new hands. If the men do not accept the 10 per cent. reduction we shall simply close the works." The company have been able to book only two orders thus far for this year, and these would be sufficient only to give the men work for about two months. The price for which these were sold renders it impossible, the company claim, to pay the cost of manufacture and attendant expenses unless the men accept a reduction of 10 per cent. If the men would accept this reduction the company offered to use their best efforts to obtain orders sufficient to keep the works running for a year, and guarantee not to ask any further reduction of wages, no matter how low prices might go. The men declined this proposition, and a second proposition was made by the company, asking the men to accept the reduction until May 1, when if orders were received admitting of an advance it would be made. This was also declined, and the employees submitted one proposing a reduction of 5 per cent. until May 1, with no understanding after that time. This was not accepted by the company, and notice was given that unless the mills are running by February 1 the furnaces will be banked. The salaries of all the officers of the company have been reduced and several superintendents and policemen have been laid off. The employees at the steel merchant mill and at the blast furnaces accepted a reduction of 10 per cent. last November when the situation was explained to them, and they have been working on that scale ever since. The steel merchant mill has sufficient stock on hand to run for some time yet. The puddlers in the Albany Iron Works department accepted the reduction in December; but unless the finishing-train men accept the reduction the puddlers must stop soon and then all the departments will be closed. The average wages earned by the men range from \$2 to \$5 per day.

# The Iron Age

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A renewal of activity in the Western cut nail trade is reported. The leading jobbers have recently been buying very freely, in anticipation of their requirements during the spring months. At current rates, which are known to be very close to the actual cost of production, it is felt that not much risk of a decline exists, while, on the other hand, there are strong reasons for believing that prices may be a little higher as the season progresses. This is in accordance with the experience of previous years. If manufacturers will take a little lesson from the experience they have had, they will be careful not to sell too freely and stock up dealers too heavily at current prices, but reserve for themselves the opportunity to do a little business at better prices when the spring trade fairly opens. With judicious management there is no reason why the manufacturers of cut nails should not be able to get a little profit out of their branch of the iron trade. The evils of which they complain are principally of their own creation.

Western bar-iron manufacturers are pleased to see a growing tendency among their customers to use better material for car work. Some of the leading railroad companies of that section, it is true, have insisted upon the use of iron of a guaranteed quality in any work done for them, but others, and they are far in the majority, have been more anxious to get prices down than to get quality up. This has led to the generally accepted opinion that car iron means a very low grade of iron. The figures realized on some of the contracts placed a year or so since would if made public go far toward proving the justice of that opinion. Now, however, a change is being wrought, more and more of the railroad companies insisting upon the use of a good grade of material. The substitution of soft steel for iron in car work is confined almost entirely to the railroad companies that have always specified the quality of their iron. The improvement to which we now refer is therefore occurring where it was most needed. It is a question whether the competition among manufacturers will not be as fierce over this better class of orders as it has been over cheap iron, resulting in profitless business in any event, but this will not be an unmixed evil, as the railway equipment will be improved to the benefit of the country at large.

Simultaneously with the revival in the Western demand for steel rails comes a renewal of the demand for other track supplies, while orders for freight cars are being placed in large quantities. Those who depend upon the patronage of the railroad companies have a trite remark that with them it is always a feast or a famine; there is no middle ground of

steady business. And so it seems now. For some time the railroad companies have been purchasing absolutely nothing, while the probabilities now favor an increasing rush of orders for all classes of material, overwhelming with a flood those who were praying for a shower a few weeks since. There will probably be no trouble in furnishing everything required in the time fixed by the companies, unless it is in the case of locomotives, the builders of which are finding their facilities overtaxed. A number of them would enlarge their works if they were sure the demand would continue long enough to make the enlargement pay. This, however, is a very difficult question to determine. New locomotive works are contemplated, but the only one which has taken definite shape is at Pullman, near Chicago.

Reductions in wages, the inevitable accompaniment of lower prices of finished products, are now the order of the day in iron and steel works. In a great many cases the lowering of rates will be quietly accepted, the workmen having the intelligence to appreciate the vicissitudes of the iron trade and seeing for themselves that the tendency of prices is now toward a lower level. They have enjoyed a period of prosperity and reaped their share of its benefits, and must naturally expect to bear their part of the sacrifices to be made in meeting the altered condition of affairs. Of course there will be resistance to this among the workmen of some localities, especially where labor agitators are influential, who refuse to read the plain signs of the times and who maliciously advise their misguided followers that they are being deceived by their employers as to the true condition of business. The establishments in which there will be least friction are those in which wages are regulated by an equitable sliding scale, based on the selling price of the products made. This seems to be such a satisfactory method of avoiding labor disputes that it is a matter of some surprise that it has not been more widely adopted in our iron and steel works.

The foreign rod makers, who supply the largest part of the wire rods consumed in this country, are making their recently formed combination felt. The barb-wire manufacturers announce that they are compelled to advance the price of their product on account of the enhanced cost of rods. This is the time for American steel works to turn their attention to rods, if the foreign manufacturers will only hold up their prices persistently; but the chances are that as soon as they believe there is reason to fear serious competition on this side the Atlantic their combination will vanish into thin air. Projects are on foot, however, for the erection of several American rod mills to supply the general market, and some of them will undoubtedly be built during the current year, regardless of what foreign syndicates and combinations may do. They have an excellent field if they can keep their cost of production low enough to make the trade profitable.

An unusual number of railroad accidents resulting from broken rails, especially in the Northwest, are being reported in the daily press. In fact, the matter has grown

to be such a common occurrence that one naturally expects to see appended to every account of a railroad disaster, "The accident was caused by a broken rail." The manufacturers of steel rails will hardly find their business curtailed seriously on this account, as substitutes for steel rails will obviously be somewhat difficult to secure. Even if all the accidents so reported really were caused by defective rails, and the number of such accidents multiplied five times, steel rails would still continue to be the sole dependence of the railroad companies in the construction of their tracks. But the rail manufacturers do not take the matter philosophically. They protest against the carelessness of the average news gatherer and the shortsightedness of the average railroad official, who are too ready to lay the blame for a serious accident, involving the killing or maiming of many persons, on a broken rail, thereby causing the traveling public to distrust the safety of the most perfect appliances for rapid and pleasant conveyance yet devised. Rails will break under certain circumstances, which are usually of such a character as to test the strength or endurance of the metal much beyond what it was intended or guaranteed to withstand. But it is regarded as absolutely certain that many rails discovered broken after an accident were not the primary causes of the disaster, but were a result of it.

## Cut Nails and Wire Nails.

There are signs that the fierce antagonism which has existed between the cut nail and the wire nail is wearing away. The wire nail has forced itself into a recognized position in the nail trade, notwithstanding the most determined and persistent opposition on the part of the manufacturers of cut nails. For a time the feeling between the makers of the two kinds of nails ran so high that their agents and salesmen were obliged to confine themselves exclusively to the sale of either cut nails or wire nails. They were supplied with arguments and reports of tests intended to show the special merit of the cut nail and the defects of the wire nail, or *vice versa*. It did not seem possible to the manufacturers that both kinds of nails could be handled together. Either the wire nail was destined to drive out the cut nail, or the latter was bound to emerge from the contest as tried and proved, and the only nail worth using. As to selling them together, that was something utterly impracticable and absurd. The wholesale and retail dealers might do it, but the manufacturers seemed so far apart that it was hopeless to expect them even to get together or look upon each other with anything but hostile intentions.

There are undoubtedly a goodly number of nail manufacturers who still prefer to have their salesmen handle but one kind of nails, but wherever an agent is able to exercise his discretion he is now shaping his affairs so as to be able to furnish his customers with both kinds. This is particularly the case in the West. Some of the ablest representatives of the commercial side of the nail trade, who have in the past distinguished themselves for their intolerance of the opposing nail, have recently secured agencies for the sale of that which they formerly condemned and ridiculed. They have found that their cus-



romers demanded both kinds of nails, and like sensible men they gracefully yielded to the inevitable, and placed themselves in a position to meet a changed condition of trade.

One of the most important events in this connection, however, is the step taken very recently by a prominent Chicago wire-nail seller. He has been a careful observer of the course of the nail trade, and had months since noted the advantages of handling both kinds of nails. He has now completed arrangements by which he handles the entire product of a large cut-nail works in connection with his own line of wire nails. Having a warehouse, he can ship assorted carloads of cut and wire nails, and in this way will meet the wishes of a large class of trade which has hitherto been in need of such facilities. This case is simply mentioned as typical; others will follow. Indeed, the time seems to be not far distant when it will be found advantageous for manufacturers to ship both cut and wire nails from their own factories. If the wishes of small jobbers and the retail trade were respected preparations would be under way for doing it now.

The consumption of wire nails now seems to have settled into a regular channel, which shows but little variation. Distributors say that about one-fourth of their nail sales consists of wire nails. For the present, therefore, the status of the two kinds of nails seems to be defined. The rapid increase in trade, which was such a feature of the wire-nail business last year, is not generally expected to continue this season, but wire nails, it is believed, will hold their own. It would appear that now the members of the nail trade can "take their bearings" better than they could some months since, when the contest between the partisans of the two kinds of nails was bitter, and the dust then kicked up obscured the vision of both sides. Prejudice having been overcome, and certain facts having been established, it remains to be seen how the nail trade generally will accommodate itself to the new conditions. There seems to be no question now of "the survival of the fittest." Both of the contestants are expected to live and attain vigorous growth with the increased requirements of the country.

We print elsewhere a compilation based upon an extended correspondence showing the increase in the coking capacity during the year 1887. The figures submitted probably do not embrace all the new plants, but they do include by far the greatest number of them. They indicate an increase in Pennsylvania of not less than 1641 coke ovens outside of the Connellsville district, to which must be added 988 ovens put up in the latter during 1887. A much more marked growth has, however, taken place in West Virginia, where the number of ovens has more than doubled during 1887, and even more are under construction. We find that there were 1178 ovens on the 1st of January in the State, to which 1344 ovens were added in 1887, and that at least 1400 are now being built. This would point to early relief of those who have been squeezed in the past by the Connellsville operators. Eastward and northward the new developments in the Reynoldsville and Clearfield districts will afford greater supplies. Westward the

Latrobe and the West Virginia works will appear as quite formidable competitors. If the new elements had come only from one direction the united producers of the great district might look on with equanimity, but now that the rush for fuel is over and the days when consumers must beg rather than be courted have passed by for some time to come the effect of the advent of the newcomers will be more keenly felt. Until now the other districts have not been forced to push business by making any notably lower prices to consumers. When the temporary effect of the anthracite coal strike is over the outsiders will find that they may be forced to cut to effect sales.

#### Our Petroleum Export in 1887 and Russian Competition.

The price of crude and refined oil ruled at a lower figure last year than for several years past, crude at 6.15 cents per gallon, in barrels, against 6.35 cents in 1886, 7.16 cents in 1885 and 7.25 in 1884, in the New York market, while refined averaged 6.75 cents, against 7.07 cents, 7.86 cents and 8.28 cents. At these prices the total export of the United States shows a slight increase:

#### Exports of Crude Equivalent from all Shipping Ports.

	1887. Gallons.	1886. Gallons.
New York.....	479,654,495	499,226,483
Philadelphia.....	193,779,717	182,764,718
Baltimore.....	12,741,061	16,740,323
Boston.....	5,609,544	4,246,003
Perth Amboy.....	22,434,260	8,109,400
St. Louis to Mexico by rail.....	1,683,540	1,145,213
Totals.....	715,902,617	712,232,140

The export from New York, on the other hand, has fallen off somewhat, both in refined and crude, as the following table shows. There was, it is true, a notable gain in the export to Germany, but shipments to Eastern countries have decreased in a striking manner. Whether this decrease was due to overstocked markets or partially to Russian competition, or to both, it is, of course, difficult to determine.

#### Export of Refined Petroleum from New York, in Thousands of Gallons.

	1887.	1886.	1885.
To England.....	51,165	52,461	51,806
Germany.....	75,401	64,090	63,619
Scandinavia.....	4,617	6,544	5,924
Denmark.....	3,511	4,831	6,067
Belgium.....	35,984	32,581	29,268
Holland.....	34,031	36,635	22,901
The Mediterranean ..	8,576	8,502	11,970
India and Siam.....	24,988	35,579	25,941
China and Japan.....	25,444	34,146	40,565
The Straits and Funda Islands.....	22,358	29,971	22,682
Africa.....	8,831	6,089	6,769
Australasia and Sand- wich Islands.....	6,923	8,294	6,348
South America.....	17,304	16,947	12,418
Central America.....	622	385	318
Mexico.....	1,912	1,404	1,167
Canada.....	1,936	2,020	1,498
Cuba.....	816	606	415
British West Indies and Guinea.....	1,968	1,769	1,877
Other West India Islands.....	1,388	1,346	1,386
Totals.....	327,775	344,200	313,029

#### Export of Crude Petroleum from New York, in Thousands of Gallons.

To France.....	26,869	30,349	29,987
Austria.....	1,735	2,137	3,354
Spain and Cuba.....	11,399	10,398	14,921
Other countries.....	4,412	3,131	..
Totals.....	44,415	46,015	48,262

Russian competition does not, as yet, look very formidable, to judge from the

returns for the first ten months of 1887, which we subjoin. Still it is not to be despised, the Russians shipping direct to leading ports in British India by tank steamers via Suez. A cable message, dated January 21, states that a company which has obtained a concession from the Czar is laying a pipe line from Baku to Batoum.

#### Export of Petroleum from Russia During the First Ten Months of 1887.

	Gallons.		Gallons.
To Turkey.....	7,775,110	Spain.....	40,000
Fiume, Aus- tria.....	11,127,890	Burma.....	738,000
Trieste.....	7,693,600	Malta.....	120,000
England.....	5,213,720	Total.....	55,489,185
Belgium.....	4,748,900	To Russia.....	7,129,050
India.....	6,422,140	Total.....	62,618,235
France.....	2,159,450	Against same time in 1886.....	52,759,625
Italy.....	1,099,150	Increase.....	9,858,610
Germany.....	3,379,985		
Romania.....	923,450		
Bulgaria.....	179,300		
Egypt.....	3,226,900		
Holland.....	641,500		

On the other hand, enterprise in the way of pipe lines is stirring in our own country likewise, if we are to believe what was stated from Toledo, Ohio, a short time ago, to the following effect:

A gigantic scheme of the Standard Oil Company, involving millions of dollars, has just been unearthed here. It is for a great trunk pipe line from Chicago to New York by way of the Ohio and Pennsylvania oil fields. The pipe line when completed will be nearly 1000 miles long, and will cost at least \$5,000,000. It will connect the Ohio and the Pennsylvania fields, and oil can be piped eastward or westward, as desired. The Standard Company have already begun to lease the right of way through Ohio and Indiana. Thousands of acres of the best oil lands have been secured, and the intention is to develop and test all the country between Chicago and Lima, Ohio. The step was made necessary by the high railroad rates consequent upon the carrying into effect of the Interstate Commerce law, and the intention of the Standard Company is to utilize the oil pipes to Chicago for fuel as well as illuminating purposes.

As the shipments of refined oil to India are made in tin cans and boxes, the intelligence that a direct steamship line is soon to be in operation, connecting New York with that country, is also of importance in this item of our petroleum trade. It appears that Henderson Brothers, the agents of the Anchor Steamship Line, will soon start a regular monthly line of steamers between New York and India. The vessels on the new route are to include the Asia, the Belgravia, the Arabia, the Britannica, and the Hesperia. The Asia, 2023 tons, is about due at New York with a full cargo of merchandise from Calcutta. It is believed that the new line will soon monopolize the Indian trade hitherto confined to sailing vessels.

The energy which Russia and Russian subjects are meanwhile displaying in developing the resources of the Caucasus where the great oil region lies is something remarkable, and so are the railroad schemes to be pushed with the utmost vigor. A wealthy firm of tea merchants, one of the largest in Russia, has acquired extensive tracts in the neighborhood of Soukhoum Kalch and along the Circassian coast, on which they are about to raise tea plantations. These will shortly be placed under the care and direction of Russian experts, who have been sent to China to study tea culture, and are now about to return. An experienced tea cultivator, formerly resident in China, and who has prospected the Caucasus, is of opinion that tea culture will form a considerable staple

in the future industries of that region. A large tract of country near Merv was purchased in the spring of 1887 by a Russian company for a cotton plantation, and the investment proves promising. The Russian Government will not allow foreign competition, an American company having been refused permission to engage in a similar enterprise. At the same time it is stated that from Orenburg to Ekaterinenburg the country is dotted with asbestos deposits, while near the Verkni Tagil Iron Works is a hill called the "Shol Kovaya Gora," or Hill of Silk, which is stated to be entirely composed of asbestos. The mineral is said to be of the best white quality, and adapted for all important purposes to which asbestos is applied. In the Goroblagsdat district of Perm similar deposits crop above the surface, and any quantity can be obtained for nothing, the mineral possessing no value in the Ural region.

Russia has just positively resolved to undertake one of the colossal railroad enterprises of this generation, and next spring work will be begun on an Asiatic trunk railway, to stretch from Tomsk across Siberia to the Pacific by way of Irkutsk, Stretinsk, Khankat or Hankoi to Vladivortok. The work is expected to be completed in five years. Communication between St. Petersburg and Ekaterinenburg is already established, and a line to Tiumen is in progress. That covers only about one-third of the distance, and from Tiumen the line joins Tomsk, above alluded to. The work of construction will be carried on from both ends. The line will be of great advantage in developing the resources of Siberia, and it will enable travelers to cross from the Pacific to St. Petersburg in something like 15 days. Much stress is laid on its strategic importance, giving, as it does, a chance by the transport of troops to cover the Chinese frontier.

That in the meantime the introduction of Russian petroleum into Eastern countries will be pushed with renewed energy and perseverance is certain. The struggle between the American and Russian article in that direction will thus receive great impulse, and we do not fail to point this out to the petroleum trade, as the fight is likely to be a close one.

Iron and steel axles imported in a partially manufactured condition and finished in the United States by being turned in a lathe would be entitled to a drawback of the duties paid upon the articles in an unfinished condition, less 10 per cent., when exported separately as axles; but the privilege of drawback would not be allowed on such articles when exported with wheels made of domestic material and attached thereto. In the latter case the exported trucks would not be "articles wholly manufactured of materials imported" within the contemplation of the law.

The spring meeting of the American Society of Mechanical Engineers will be held in the city of Nashville, Tenn. The exact date has not yet been fixed, but it will probably occur in the end of April or beginning of May.

Mr. J. T. Sheehan, the agent for the Australian Exhibition at Melbourne, begs us to note that communications will reach him by addressing him, care of Messrs. E. and H. Batcheller & Co., 106 Sumner street, Boston, Mass.

## CORRESPONDENCE.

### The Right of Manufacturers to Local Territory.

*To the Editor:* We read with much interest your valuable article, in edition of January 5, on the wire-nail industry. It seems to us, however, that there is one point which you did not touch upon in surveying the outlook for the business. This is, that in view of the number of concerns now in the business and those coming in, the trade in wire nails is bound to be localized ultimately—that is, each manufacturer will in time be restricted to the territory which immediately adjoins the city or town of his location. This has been the natural outcome of the cut-nail business. A cut-nail manufacturer in New England does not now seek to control trade in Ohio, nor does one in Pennsylvania try to market his goods in Iowa. It is surprising, however, to note the tenacity with which two or three of the larger wire-nail concerns, who are centrally located and formerly sold their nails generally through the country, cling to territory in which other manufacturers are now established, seeming to think that, being a little older, they have the right to monopolize all the business.

We, as small manufacturers, are located in a city of about 25,000 population, and only seek to control the trade in the city and the country immediately adjoining, not trying to invade territory which properly belongs to other concerns. Our local customers all give us a preference for their trade, and we doubt if any outside goods of any account have been sold in our city for several months past. Notwithstanding this, however, the large concerns aforesaid continue to drum this territory and make cut prices which are duly turned over to us to meet, and avail nothing to the parties who spend their money for traveling expenses, postage and stationery to whittle down our margin. We have come to stay, and while we should stop our machines if others wish to sell goods in our legitimate territory at an actual loss, they would most assuredly be started again when our friends the large manufacturers mentioned had overcome their zeal to lose money. We think a little discussion in your columns of the matter of the localization of trade and as to how much territory each manufacturer should seek to control might be profitable to all concerned. Yours very respectfully,  
WIRE NAILS.

### Railroad Spike Machinery.

*To the Editor:* We are in want of a machine or machines to make railway spikes or brobs, principally the dog spikes, with ears and with chisel points. If any of your subscribers will kindly give us the names of makers of such we shall be obliged. Makers of such machines, who may address us direct, should state how many spikes the machine will make per hour; the average percentage of wasters and where said machines are running, particularly if such can be seen in Europe. We have, of late years, increasing inquiry for American tools and labor-saving appliances, and if any of your advertisers and subscribers like to send us, from time to time, particulars of likely articles for our market, business may result.

Yours faithfully,

H. J. SKELTON & Co.  
London, E.C., 12 Lime street, Jan. 2, 1888.

### A New Wire Nail Machine.

*To the Editor:* In your issue of January 19 W. Adler gives a comparison between a new cut nail machine and plant of the ordinary wire nail machine, and asks, "How the wire nail can down the

cut nail." In his comparison he uses the latest improved cut nail machine against an old style wire nail machine, which is not fair. I have a new wire nail machine that I wish to compare with his cut nail machine, using for illustration the same estimate for cost of wire, number of nails per pound, hours of run, &c., that he has used in the illustration of wire nail plant. My machine, running at 175 revolutions per minute, will turn out 875 of 8d casing nails, running 170 to the pound, per minute. Now compare the result of eight of these machines as against eight of the cut nail machines he refers to.

Take the cost of production under these circumstances, 34,588 pounds of wire, less 1 per cent. waste, giving 34,243 pounds of nails at \$5 per 100 pounds.....	\$1,027.50
34,588 pounds of wire at 2.38 cents.....	\$823.19
Labor to run machines.....	1.50
Labor to make tools.....	2.50
Labor to clean and keg.....	3.00
Office expense.....	2.50
Room and power.....	1.00
Cost of kegs at 16 cents each.....	54.72
Cost of selling at 10 cents each.....	34.20
Total cost.....	\$922.61
Giving a net gain of...	\$104.89

One man will run eight of my machines, and 1 per cent. waste is ample allowance with it.

Mr. W. Adler, in his estimate of the capacity of the cut nail machines, makes a mistake, for while he says that it will make 800 of 8d nails per minute, running 164 to the pound, he claims that it turns out 330 pounds of nails per hour. This is wrong, as it should be 293 pounds, which will make a large difference in his estimate. Besides, as you point out, he has allowed nothing for waste. When he has rectified these mistakes, and allowed something for rent and power and the expense of making tools, it will reduce his net gain considerably. In answer to the question "How can the wire nail down the cut nail?" I would say, use the latest improved wire nail machine. J. T. KENNEDY.

NEW HAVEN, CONN.

### Heating and Ventilating Buildings.

*To the Editor.*—We notice in your issue of January 19, 1888, a letter from S. Landon & Son, regarding the "Economical method of Heating and Ventilating an Office and Warehouse Building," as presented in the paper by Henry I. Snell. Having constructed the apparatus which Mr. Snell has in use we may be pardoned for saying a few words regarding it and the system. The apparatus in various forms has been manufactured by us for upward of 25 years and notwithstanding its extended introduction there appear to be many who are as yet unacquainted with its applications. One of the first queries that generally arises in the mind of our inquirer is just that to which your correspondent calls attention—namely, how may the apparatus be arranged so as to allow the engine to remain idle a portion of the time. If properly constructed the exhaust from the engine should always be used in the heater. It is well known that the heating power of live steam of 70 pounds pressure is but 3 per cent. more than that of exhaust steam, and hence so far as economy is concerned it makes but little difference which is employed for heating. A given amount of steam being required to accomplish the proper heating of a room or building, it will be seen that that steam may be allowed to pass through the engine on its way to the heater, turning the engine by this means, and yet the cost of the steam for running both engine and heater will be practically the same as that required to run the heater alone. In other words, when a steam fan is used in connection with a heater and the exhaust from the engine is used in the



heater, the expense of turning the fan will be nominally nothing.

For rapid action and effectual distribution of the heated air nothing equals the system of hot-air heating and ventilating by means of a steam hot-blast apparatus. It has this most marked advantage that, whereas all other systems are dependent upon relative temperature of indoor and outdoor air or on the direction and force of the wind, this system is always positive—air is always delivered where it is wanted, and not simply allowed to find its way there, successfully or otherwise, according to circumstances. Not only in halls of audience, public buildings, stores and the like does it find a good opportunity for successful application, but in manufacturing establishments of all kinds it proves a long-sought boon. Such buildings as the Mattoon Mfg. Company's large furniture factory at Sheboygan, Wis., and the extensive shops of the P. C. & St. L. R. W. at Columbus, Ohio, have introduced it within the past year. Parties interested might correspond with the proprietors of the same, or we should be pleased to give them any information they may desire.

B. F. STURTEVANT.

Boston, Mass., January 21, 1888.

### The Shiras Barb Wire Decision.

We print below abstracts of the decision of Judge Shiras, of the United States Circuit Court, Eastern Division of the Northern District of Iowa, in the case of Washburn & Moen Mfg. Company, and Isaac L. Ellwood, complainants, vs. Beat-tem-All Barbed Wire Company, et al.:

The complainants, as the owners by assignments of Letters Patent No. 157,124, issued to Joseph F. Glidden under date of November 24, 1874, and declared to be for an improvement in wire fences, file the present bill for the purpose of "restraining the defendants" from continuing the "manufacture of barbed wire" at Waterloo, Iowa, on the ground that the wire so manufactured by defendants includes and embraces the improvements covered by the Letters Patent above named. In substance, the defenses interposed are:

1. Want of useful novelty in the Glidden patent.
2. That if there are elements of novelty in the patent in question, Glidden was not the first inventor thereof.
3. That even if it be true that Glidden was the first person to construct the barb or spur upon fence wire, by winding around the plain wire a short piece of other wire, nevertheless he had dedicated or abandoned such improvement or invention to public use before he obtained the present patent.

In order to ascertain the elements of novelty, if any, embraced within the combination described in this patent, No. 157,124, it is necessary to ascertain the progress that had been made in the development of what is now known as barbed-wire fences, at the time Glidden entered the field in 1873. \* \* \*

When Glidden applied for this patent in 1873, the use of a plain wire for fencing was old; the use of a twisted wire to increase the strength of the fence was old, being found in the Kelly patent of February 11, 1863; the use of spurs or sharp points attached to the fence wire, to prevent animals from rubbing against and thereby breaking the same was old, being shown in the patents of Smith, Hunt & Kelly; the making of the spur, thorn or barb out of a short piece of round wire was old, being shown in the second patent to Kelly, issued November 17, 1868.

Novelty in the Glidden combination is predicated of two things; one, in the mode in which the spur or barb is attached to the fence wire, to-wit: by coiling it around the same, so as to leave the two ends of the short wire projecting from the fence wire; the other, in clamping the spur thus formed in its proper place, by means of the second wire twisted around the first.

Examining these claims in the reverse order, is there novelty shown in the use made of the second wire in the Glidden combination? \* \* \*

It is the twisted wire that checks the motion in both instances. Its office and function is the same, and if the barb in the one case can be moved over a greater arc of a circle than in the other, this is caused by the difference in the form of the barb, and is not due to any difference in the manner of putting on the second or twisted wire, nor to any difference in the function it performs in the Glidden, as

compared with the Kelly combination. \* \* \* The utmost that he could have asserted in support of his claim to a patent therefore would have been that he perceived more clearly the beneficial effect resulting from the combination in the direction of holding the spurs upon the wire, but he could not have successfully asserted that any act or thought of his had produced or increased the beneficial effect of the twisted wire used in combination with the Kelly barb. Kelly had invented or made known the combination; the combination when used will aid in holding the spurs in place upon the wire, and cannot be used without producing this effect. It is an absolutely necessary mechanical result.

The fact that Glidden might have perceived with greater clearness the results that flow from the use of the second twisted wire would not entitle him to a patent as the inventor of such use.

So far I have considered the question upon the theory that the beneficial effect produced by the use of the twisted wire was mainly due to what I have termed its blocking effect, that is, to the fact that when the second wire is twisted around the first, or fence wire, it prevents free lateral or circular motion of the barb by bodily occupancy of the lines of motion. This is the view in which the point was discussed by counsel on the argument, and it is, in my judgment, the true view to be taken of the effect intended to be produced by the use of the twisted wire in both the Kelly and Glidden combinations. \* \* \*

The conclusion that the drawings and specifications of the Kelly patent of February 11, 1863, shows the use of the second wire for the purpose of preventing motion in the barb, is in accordance with the finding of the United States Circuit Court for Northern District of Illinois, in the case of Washburn & Moen Mfg. Company vs. Hunt, 4 Fed. Rep. 900.

We are thus brought to a consideration of the question whether patentable novelty in the Glidden combination is formed in the mode in which the spur or barb is constructed and affixed to the wire.

In view of the fact that in 1873 when Glidden applied for his patent, the use of barbs upon a wire fence and the use of a twisted or second wire to aid in holding them in place, and the mode of affixing the barbs upon the wire, by passing the fence wire through an aperture in the middle of the barb, and the formation of the barbs out of pieces of short wire with sharpened ends were all known and described devices, it is not to be wondered at that the claim of novelty asserted in support of the Glidden patent, growing out of the mode of constructing and affixing the barb, has been sharply criticised. That a barb constructed in the mode shown in the Glidden patent is simple and most effective, cannot be questioned.

It was a valuable improvement in the art of constructing wire fences. Its utility cannot be gainsaid, yet it is urged on behalf of defendants that the coiling of the short wire forming the barb around the fence wire, which is all the change actually made by Glidden, was not the exhibition of inventive thought or skill on his part, but is only an instance of mechanical improvement in the direct line clearly pointed out by the previous inventors.

I do not propose, however, to do more than to state the proposition involved in general terms, for the reason that I am not called upon to decide this question as an original proposition, for the reason that this exact point was heard and determined by Judge Brewer, in the case of these complainants vs. The Grinnell Wire Company, 24 Fed. Rep. 23, in the Southern District of Iowa, it being held by the circuit judge that the formation of the barb by coiling the transverse wire between its ends around the fence wire was first expressed in Glidden's application for a patent, and that is was novel and useful to a degree sufficient to support the combination covered by the patent now in question. Relying upon the conclusion reached in that case, it follows of necessity that the defense of useful novelty in the Glidden patent cannot be sustained, by reason of the fact that the mode of forming and affixing the barb by coiling the barb wire around the fence wire is held to be a useful and patentable improvement.

It is contended, however, by the defendants that Glidden is not the originator of this form of barb, and that this mode of constructing and affixing the barb was known and in use long prior to the date of the Glidden patent.

The burden of establishing prior use is, of course, upon the defendants, and it is a defense needing clear and satisfactory evidence in its support. It cannot be vested upon mere possibilities, or even probabilities, but it must be made practically certain in all essential particulars.

The first instance of prior use relied upon by defendants is that known as the Morley invention. In the case already cited against the Grinnell Wire Company, decided by Judge Brewer, it was claimed that a panel of wire fence had been exhibited at Delhi, in Delaware County, Iowa, at a fair held in 1858 or 1859,

containing barbs put on by coiling the same upon the fence wire. The evidence touching the same was evidently wanting in many particulars, as is shown by the remarks of the judge to the effect that it was not disclosed who made the fence, nor whence it came, nor where he went, nor was any part of the wire shown to be in existence.

The defendants in the present case claim that one Alvin Morley was the exhibitor of the panel of fence at the Delhi fair, and that they have proved that he had used other specimens of his fence in several different ways or places, and that it consisted of a plain wire with barbs rolled around it, made out of short pieces of wire with sharpened ends. The evidence introduced in regard to Morley's invention covers many hundred pages, embracing the testimony of a large number of witnesses introduced on behalf of both parties, and the utmost I can do is to indicate the general or salient points connected therewith.

It is an unquestioned fact that Alvin Morley owned lands in Delaware County; that his family lived in Bradford County, Penn.; that for a number of years, including 1858 to 1864, he spent a large portion of his time in Iowa, living alone or boarding with his neighbors; that he was not of entirely sound mind, and that he died in an insane asylum in Pennsylvania, in 1867, having been placed therein in 1866.

It is also shown that after the beginning of the war, that is, after 1861, the county fairs of Delaware County were held at Manchester, none being held at Delhi after 1861. Whatever was exhibited by Morley at Delhi, and, in fact, whatever he did in the line of making barbed wire fences, it is evident long preceded the application for the Glidden patent.

It is an admitted fact that Morley had invented what is termed a traveling cow pen, being a pen with three sides, placed on wheels, and so constructed that it might be moved by the animal inside of it.

Some seven or eight witnesses testified that at different dates when they saw this machine it had on it one or more strands of fence wire with barbs or pricklers on it, put on in the same manner as were the pricklers on the Delhi fair exhibit.

A large number of witnesses testify to the existence upon what are termed Morley's north and south farms, of short pieces of fence made of plain wires, with barbs twisted around them. Many circumstances are detailed by the several witnesses in connection therewith, as facts aiding their recollection and supporting the testimony they give, but it is impossible to even briefly state them within any reasonable limits.

To meet this array of testimony in support of the allegation that Alvin Morley had used a barb of the same form as that found in the Glidden combination, the complainant rely: first, on the improbability of a man with the mental characteristics of Morley being able to conceive or invent such a fence.

That he was of unsound mind is not questioned. The undisputed facts show, however, that he had ability enough to attend to his business affairs, and that his mind ran on inventions of different kinds.

Dr. Boomer, a witness called by complainants, who attended Morley professionally, and knew him from 1858 or 1859, testified that he was sane most of the time and upon most subjects.

Taking the whole evidence together it wholly fails to show that in 1858 and 1859 Morley did not possess sufficient mental ability to do all that is claimed that he did. Complainants' next reliance is upon the testimony of the immediate family of Mr. Morley, to the effect that they never heard him say anything about barbed wire or barbed wire fences. \* \* \*

In regard to the fair exhibit there are but two solutions that are admissible. Either the witnesses for defendant have been enabled to recall and testify to the series of facts detailed by them because they are true, or else a number of these witnesses have intentionally concocted a false story, and have invented, knowingly, the circumstances detailed by them, thus committing perjury by the wholesale. To successfully accomplish what has been done in this regard, if the story is false, has necessitated a careful preparation of the witnesses and a thorough and systematic training of them, which would of necessity inculcate a very large number of persons.

Not only is there an entire lack of evidence to show that such a nefarious plan had been undertaken, but no motive can be conceived of that would induce so large a number of well-known persons to engage in such a conspiracy.

If this solution is not admissible then it must be accepted as proven beyond all reasonable question that as early as in 1859 Alvin Morley had, for the purpose of rendering plain wire more effectual as a fence, placed thereon what are now known as barbs made by twisting short pieces of wire around the fence wire, with the sharpened ends projecting therefrom, and that he had exhibited a specimen of wire thus prepared with barbs at the fair held at Delhi in 1859.

This being proven and accepted as a fact, then valuable support is given to the testimony on part of defendants tending to show the use of this wire by Morley in the other ways and places named in the evidence, and it must be held that such use is established. \* \* \*

Defendants also rely on the further defense of abandonment on part of the patentee, basing this upon the facts connected with his applications for the several patents issued to him. \* \* \* Having reached the conclusion that the defendants have shown that Alvin Morley did, as early as the year 1859, make use of a barb formed of a sharpened wire coiled around the strand or fence wire for the identical purpose subserved by the barb in the Glidden combination, and that this use was not confined to mere experiment, but was applied in the construction of fences upon his property, and because known to his neighbors and acquaintances it follows that Glidden is proved not to have been the first inventor of either the twisted wire or the coiled barb forming his combination, and if he was not the inventor of either then the only change he made in his combination was to substitute for the Kelly form of barb a coiled barb, not his own invention, and this act of substitution cannot be held to be invention, as the result of the combination did not effect any novel result.

This being so, the patent in question cannot be sustained.

On the 20th of June, 1874, Glidden filed an amended specification in the application already rejected, and finally, on the 24th of November, 1874, the patent involved in this suit was issued.

January 26, 1876, an application for a reissue of the patent of May 12, 1874, was filed, and granted under date of February 8, 1876, the claim being for "In combination with a fence wire a barb formed of a short piece of pointed wire secured in place upon the fence wire by coiling between its ends, forming two projecting points, substantially as specified."

This reissue has been adjudged to be void, being an attempt to enlarge the claim of the patent on which it is based.

There can be but little question that if Glidden had not procured the issuance of patent No. 157,124 on the amended specifications filed June 20, 1874, there would be no escape from the conclusion that either he did not claim to have invented the coiled barb, or if he had originated the same that he had dedicated such inventions to public use.

In the amendment filed December 9, 1873, a disclaimer of the invention of prongs is made, the claim being for the combination of prongs or spurs with the twisted wire.

Taking this disclaimer in connection with that found in the application for patent No. 150,683, and remembering that in these applications and drawings the mode of forming the barb by coiling the same around the fence wires is expressly shown, it would seem an unavoidable conclusion that Glidden had thus fully shown this mode of affixing the barbs, had practically disclaimed being the inventor thereof, and had thus fully authorized the public to make use of this form of barb or spur.

If, therefore, he had not renewed his application on June 20, 1874, by the amendment then made, the defense of abandonment would be clearly established.

On part of the defendants it is claimed that the filing of the amendment in June, 1874, and the subsequent issuance of the patent in suit, does not change the legal effect of the fact stated, and that the disclaimers found in the applications are just as cogent evidence of abandonment in the one case as in the other.

On behalf of complainants it is urged that the patent, when finally issued, reverts back to the date of the original application, and in effect it speaks from that time.

Under ordinary circumstances this is doubtless true, but there are exceptions to the rule.

The doubt in my mind in the present case arises from the uncertainty as to the real claim intended to be asserted by Glidden to the form of the barb or spur as shown in his combination, when he originally applied for a patent in October, 1873.

Assuming that the patent as finally issued covers the form of the barb or spur as shown in the Glidden combination, which is the effect of the adjudication by Judge Brewer in the Grinnell case, and that Glidden sought in his original application to secure that as part of his combination, then it is made clear that by the disclaimer filed he intended no more than to negative the idea that he claimed to have originated the idea of putting spurs or prongs upon plain fence wire.

The fact that he renewed his effort to obtain a patent upon his original application as amended, and finally succeeded therein, shows that he had not abandoned his claim to whatever of novelty might be found to exist in the combination covered by the patent issued, and read in the light of his action in this particular it must be held that the evidence fails to sustain this defense.

The patent being void, however, on the ground that it is only a combination of known elements for the production of an old result, of which Glidden was not the first inventor, and that it is therefore lacking in patentable novelty, the bill in this cause must be dismissed on the merits at complainants' costs.

### Recent Canadian Customs Decisions.

The following Departmental decisions have been made since October, 1887, by J. Johnson, collector at Ottawa, for which we are indebted to G. W. Jessop, Dominion appraiser. The following was issued October 11:

Serial No.	Article.	Tariff item under which classed.	Rate of duty payable.
4	Bricks made from anthracite coal waste.....	525	20 %
7	Brass patterns.....	47	30 %
9	Black lead manufactured of alum-bago.....	379	25 %
12	Butter knives, plated.....	375	50¢ doz. & 20 %
13	Corrugated Galvanized sheet iron.....	274	30 %
19	Chains, trace (parts of harness).....	205	35 %
22	Carriage wheels.....	83	35 %
23	Coal dust, all kinds.....	104	20 %
30	Fire hose of cotton or linen lined with rubber.....	388	5¢ lb. & 15 %
31	Fire-brick stove linings, parts of stoves.....	221 & 274	30 %
32	Gun wads, cardboard.....	352	35 %
33	Gun wads, felt covered with paper.....	352	25 %
34	Gun wads, plain felt not otherwise prepared.....	525	20 %
36	Gun covers.....	487	10¢ each & 30 %
39	Galvanized sheet iron, thicker than No. 20.....	274	30 %
40	Hydrants, valves and water gates.....	274	30 %
42	Iron slag.....	525	20 %
43	Iron tubing, wrought square.....	269	6-10¢ lb. & 30 %
44	Iron stove shovels.....	232	30 %
45	Iron Rods, ½, 5-16, ¾, 1½ inch diameter, coppered.....	274	30 %
57	Plow plates, mold boards, &c., parts of plows.....	468	35 %
59	Paving blocks made from slag of blast furnace.....	525	20 %
60	Pumps, steam & machinery.....	243	30 %
62	Pens, steel.....	274	30 %
66	Rubber rollers for wringers, if fitted up with iron shaft, as parts of wringers and dutchable as provided by Section 61, Clause 2, of the Customs act, and if of rubber only, 25 % as manufacture of rubber.....	101 & 210	
67	Railway depot express trucks.....	84	30 %
68	Steel traps.....	274	30 %
69	Steel spring wire, tinned or coppered, 1 to 8.....	274	30 %
70	Steel or iron wire galvanized or not, 1 to 5.....	241	25 %
72	Steel disks for harrows.....	468	35 %
73	Steel scraper plates.....	274	30 %
74	Steel or iron surgical instruments, plated.....	245	20 %
75	Steel cut to shape for mold boards, &c., for plows.....	468	35 %
78	Scythe handles or snaths.....	468	35 %
80	Steam pumps & machinery.....	243	30 %
81	Trace chains as harness.....	205	35 %
88	Wire, manufactures of.....	274	30 %
90	Zinc dust.....	525	20 %

Under date of October 15 the following was issued:

HINGES, &C.—To avoid errors in interpreting item No. 272-85 of the tariff your attention is called to the following reading thereof, which must be your guide in accepting entries: Wrought iron or steel nuts and washers.....1¢ lb.&25 % Iron or steel rivets, bolts with or without threads or nuts, and bolt blanks.....1¢ lb.&25 % Iron or steel finished hinges or hinge blanks.....1¢ lb.&25 %

The words "not elsewhere specified" have reference to the whole item, but do not apply to any item in the tariff except those in which the same articles may be distinctly mentioned with other conditions or descriptions. You will understand by the above reading that the word "wrought" in the first line of the item refers to "nuts and washers" only; therefore in any of the other articles named it is only necessary to inquire whether they are made of iron or steel without regard to whether they are wrought, forged or cast, but the item has no relation to such articles when made of brass, bronze or any other metal than iron or steel.

Under date of October 20, 1887, the following was published:

IRON AND STEEL WIRE.—For convenient reference and to promote uniform action, I give you the following compilation of the tariff provisions respecting iron and steel wire:

Item 216—Barbed wire fencing, 1½ cents per pound.

Item 218—Buckthorn and strip fencing, 1½ cents per pound.

Item 241—Iron and steel wire, galvanized or not, 15 gauge and coarser, 25 per cent. ad valorem.

Item 271—Spring steel wire, coppered or tinned, 9 gauge or smaller, 20 per cent. ad valorem.

Item 503—Wire covered with cotton, linen, silk or other material, 25 per cent. ad valorem.

Item 850—Wire of iron or steel, galvanized or tinned, 16 gauge and smaller, free.

Item 851—Wire rigging for ships or vessels, free.

Item 274—All iron and steel wire not enumerated in above nor coming under the following provisions, 30 per cent. ad valorem.

883—Homo spring steel wire, coppered or tinned, smaller than No. 9 and not smaller than No. 15 gauge, when imported by manufacturers of mattresses for use in their own factories, free.

000—Wire of iron or steel, galvanized, tinned or coppered, or not, No. 16 gauge and smaller, when imported by manufacturers of wire cloth and wirework to be used for such purposes in their own factories, free. J. JOHNSON.

Additional changes were made on the 2d November, 1887.

Serial No.	Article.	Tariff item under which classed.	Rate of duty payable.
93	Copper baths, manufactures of copper.....	123	2¢ 1 lb. can.
98	Gongs for doors—as bells.....	25	30%
99	Iron or steel, hot rolled, double or treble reeled. (The second or third reeling has been found to be a polishing process, and such iron or steel should be charged 1-6¢ per lb. in addition to other duty.....	26	
101	Oreide—a yellow metal in thin sheets, copper being one ingredient.....	127	30%
102	Pails manufactured in the United States in which oysters are imported are liable to duty each time they are brought to Canada, but if they are wholly manufactured in Canada, and are properly branded by the Customs, they may be sent to the United States, and on return entered free on identification. (See Regulations, 21st June, 1884).		
105	Stove pipes and elbows.....	274	30%

The following circular was issued on the 17th of December, 1887:

On the recommendation of the Minister of Customs the Governor-General has ordered that the proper duty payable on plow plates, mold boards and land sides, cut to shape, but not molded, punched, polished or otherwise manufactured, and when so cut to shape from rolled sheets of crucible steel, and being of greater value than four cents per pound, shall be levied and collected under item No. 57 of the Schedule of Customs Duties, Act 50-51 Victoria, chapter 39, at the rate of 12½ per cent. ad valorem; and in all other cases not answering above description in full, plow plates, mold boards and land sides shall be rated for duty as



parts of plows under item No. 146 of said last mentioned act, and in accordance with section 61, sub-section 2, of the "Customs Act." This order to take effect on and from the date hereof, and to remain in force until the end of the next succeeding session of the Parliament of Canada, unless sooner repealed.

Departmental decisions for November include the following rates:

Serial No.	Leader No.	Article.	Tariff items under which classed.	Rate of duty payable.
169	125	Automatic locomotive bell ringers.....	274	30%
121	111	Enameled iron hollow ware....	232 & 274	30%
124	127	Finger bars and reaper and mower bars, being angle iron or steel cut to exact length, rolled, sheared off and straightened with a slot cut out of the side of each bar, as parts of reapers and mowers.....	468	35%
127	146	Galvanized sheet iron, No. 20 gauge.....	274	5%
128	121	Hickory spokes, rough turned, not tenanted, mitred, throated, faced, sized, cut to length, round tenanted or polished.....	726	Free.

#### Southern Pig Iron Freights.

T. M. R. Talcott, Commissioner of the Southern Railway and Steamship Association, has issued the following sheet of rates of freight on pig iron in carloads per ton of 2268 pounds, from Birmingham, Ala., and Chattanooga, Tenn., to points on and beyond the Ohio River, taking effect February 1, 1888:

To.	From— Birmg. Chatta.
Cincinnati, Ohio.....	\$3.35 \$2.85
Louisville, Ky.....	3.10 2.85
Jeffersonville, Ind.; New Albany, Ind.; Evansville, Ind....	3.35 3.10
Memphis, Tenn.....	2.60 2.60
St. Louis, Mo.; East St. Louis, Ill.; Belleville, Ill.; Indianapolis, Ind.; Terre Haute, Ind.	3.85 3.60
Grand Crossing, Ill.; Chicago, Ill.; Pullman, Ill.; Michigan City, Ind.; Detroit, Mich.; Toledo, Ohio.....	4.50 4.35
Peoria, Ill.; Wyandotte, Mich.; Danville, Ill.; Cleveland, Ohio; Zanesville, Ohio.....	4.60 4.10
Sandusky, Ohio.....	4.80 4.30
Columbus, Ohio; Dayton, Ohio; Springfield, Ohio; Hillsboro, Ohio.....	4.10 3.60
Lafayette, Ind.; Greencastle, Ind.; Mattoon, Ill.....	4.35 4.10
Miamisburg, Ohio.....	4.15 3.65
Akron, Ohio, and Mansfield, Ohio	4.60 4.10
South Bend, Ind.....	4.60 4.45
Pekin, Ill.....	.. ..
Newport, Ky., and Aurora, Ind.	3.35 2.85
East Saginaw, Mich.....	5.35 5.10
Newark, Ohio.....	4.50 4.00
Lima, Ohio.....	4.35 3.85
Hamilton, Ohio.....	4.05 3.55
Fort Wayne, Ind.....	4.35 4.10
Pittsburgh, Pa.....	5.25 4.75
Atlanta, Ill.....	5.80 5.55
Jacksonville, Ill.....	5.10 4.85
Allegheny, Pa.; Wheeling, W. Va.; Steubenville, Ohio; Bellaire, Ohio; Bridgeport, Ohio....	5.25 4.75

In reference to Mr. Corbin's statement to the effect that the Reading Company sunk \$12,000,000 in its coal operations, the Philadelphia Record claims to have convicted him of a blunder of \$40,000,000. It claims that by driving out all competitors the company, "with monumental greed, acquired 142 square miles of coal lands," and realized no less than \$29,000,000 in excess of amounts of miners' wages.

## MANUFACTURING.

### Iron and Steel.

The sheriff has levied on the property and works of the Columbus Steel Company, at Columbus, Ohio, to satisfy five cognovit notes held by the First National Bank of that city. The notes were given in May, June, July and November of last year, and aggregate in amount \$22,299.46. The works were closed down immediately. A receiver will probably be appointed at once and the business resumed. Among the stockholders of the company are E. L. Hinman, William Monypeny, B. S. Brown, Jonas McCune, W. W. Franklin, H. D. Turney and D. S. Gray.

A purchase-money mortgage for \$200,000 on the Monongahela Iron Works was filed in the Recorder's office at Pittsburgh on the 20th inst. It was from the Oliver Iron and Steel Company, of which H. W. Oliver, Jr., is president, to H. W. Oliver, Jr., Daniel B. Oliver, Jas. B. Oliver and John Phillips, being the organization of a new company to operate the Monongahela Iron Works.

The Spang Steel and Iron Company, Limited, of Pittsburgh, with works at Etna, Pa., are at present engaged on the work on some large Government orders, and on the order for the boiler plates for a monster merchantman being built in this country for a French company. The United States Government is having two twin steel cruisers and a large steel gunboat built. The dimensions of the cruisers are as follows: Length of mean water line, 310 feet; extreme breadth, 49 feet and 13 inches; displacement in tons, normal draft, 4083. The gunboat is to have a displacement in tons of 1700. This company has the contract for furnishing the steel for one of these cruisers and for the gunboat. According to the specifications sent out with the order the hull steel for these vessels is to have a tensile strength of over 60,000 and elongation of 25 per cent. in 8 inches.

A conference between the owners of the Lucy furnace, at Pittsburgh, and a committee of the workmen was held on Tuesday, the 17th inst., for the purpose of arriving at some conclusion regarding future rates of wages. The proprietors were represented by John Walker, chairman of Carnegie, Phipps & Co., Limited, and Walter Kennedy, superintendent of the furnaces. They proposed a reduction of 10 per cent. in wages, while the workers insisted on an advance of 10 per cent. The former argued that owing to the high price of coke, heavy freight rates and the low price of metal they cannot pay present wages. After discussing the matter for a couple of hours, Mr. Walker proposed arbitration and the proposition was accepted. The question will be left to three arbitrators, one to be selected by the firm, one by the workers and the two will select a third. The decision of the arbitrators in the above case will be waited for with considerable interest by other furnace operators and workmen, who have decided to abide by the decision as fixing rates of wages to be paid at other furnaces in the above city.

At the weekly meeting of the Wheeling Nail Manufacturers' Association, held at Wheeling, W. Va., on the 18th inst., the members declined to treat with a committee of the Amalgamated Association with a view to the revision of the scale.

About one year ago a concern known as the Carbon Iron Company, composed mainly of Eastern capitalists, purchased from Graff, Bennett & Co., of Pittsburgh, the old Fort Pitt Rolling Mills in that city, for the purpose of making iron from the ore by a new process, but it did not prove a success, and the works are now idle and will probably be sold. The report

that Carnegie, Phipps & Co., Limited, would purchase the plant is without foundation.

All departments of the plant of the Lawrence Iron Works Company, at Iron-ton, Ohio, are in full operation. The last of the two batteries of three boilers each, to replace those which exploded on October 24th of last year, were fired for the first time on the 17th inst.

The Otis Iron and Steel Company, of Cleveland Ohio, inform us, under date of the 17th inst., that their two new open-hearth steel melting furnaces will be ready to commence operations in a short time.

In answer to a report that the Bellaire Nail Works, of Bellaire, Ohio, had decided to make some extensive improvements and additions to their plant, which included the erection of a new blast furnace, we received the following letter from the company under date of the 18th inst.: "The Bellaire Nail Works have not decided to make some big changes about its works. The present nail factory will not be torn down, and placed on the opposite side of the railroad track from where it now stands, and in its place will not be erected a large blast furnace. There is nothing new in the situation here. Our steel works closed down on the 31st ult. We have been making repairs of considerable magnitude around the works and do not know at present when we will be able to resume work, as the wages for the current year have not been arranged. Our nail factory is also idle, and will probably not resume work until the nail market assumes a more favorable aspect than at present. Our blast furnace is doing very excellent work. The output for December was 4762 tons, of a very high grade of Bessemer pig, the coke used being 2028 pounds per gross ton. We consider this a very excellent record for a furnace fitted with iron stoves. So far in January it has been making an equally good record."

The Brooks Iron Co., Birdsboro, have posted up the following notice to the furnace employees only: "Owing to the price of pig iron, we must ask you to accept a reduction the 1st of February to the wages paid before the last advance. The iron has been costing more than we receive for it, and as similar reduction has been made at several other furnaces, we hope you will cheerfully accept it." Some time ago the men received 10 per cent. advance.

John Q. Denney, superintendent of the Paxton Rolling Mills, Harrisburg, Pa., sends us the following information concerning the effect of the coal strike upon their work: "We cannot say that directly it is having any effect, owing to our using bituminous coal entirely, but no doubt indirectly it is affecting us by the general unsettling of all business, which must indirectly affect us along with all others. By the accounts going the rounds of the papers the coal strike seems to be getting direct credit for more than would seem to belong to it; for instance, we fail to see in what way it could directly effect the stoppage of the Pennsylvania Iron Company's works, of Lancaster, or the Lochiel Rolling Mills, of Harrisburg, as stated, as they both use bituminous coal entirely, and bituminous coal seems to be more plentiful now and easier had than for many months, owing, we presume, to a more plentiful supply of coal as the outcome of a general slackening of the iron business."

Mr. B. F. Fackenthal, Jr., superintendent of the Durham Iron Works, Riegeisville, Pa., writes us as follows: "Our Durham Furnace has just gone out of blast for want of coal. The furnace is situated on line of Lehigh Coal and Navigation Company's canal, and we rely entirely on the canal for our coal supply. Owing to the strike in the Lehigh region we were not

able to accumulate enough coal to last us, and we are now compelled to blow out. Pequest Furnace, near Oxford, N. J., being on line of Delaware, Lackawanna and Western Railroad, is supplied with coal from the Scranton region, and is therefore not interfered with by the strike."

Mr. S. B. Lowe, of Chattanooga, offers for sale a rolling mill in the South, equipped with one 18-inch muck train, one 8-inch guide train, four puddling and two heating furnaces, with an 8-inch train ready to set with rolls and pinions for one 16-inch train.

Mr. Griffith Jones, manager of the Norway Furnace, Gabel, Jones & Gable, Pottstown, Pa., informs us that they have gradually taken up the use of coke in the place of anthracite, which they find it difficult to obtain on account of the coal strike. Instead of running one-eighth coke and seven-eighths anthracite, they are now using coke exclusively. The yield has remained about the same, but the grade of the iron has been lowered to gray forge instead of foundry irons. This is largely caused by inadequate facilities for heating the blast. For some days, when they managed to raise the heat to 900° and over, they produced beautiful No. 1 iron, and they expect to resume the production of this, their specialty, as soon as they have completed improvements now under way in their hot-blast ovens.

The Linden Steel Company, Pittsburgh, have lately succeeded in producing both ribbed and checkered plates, rolled from steel, specially adapted for the use of floors in engine-rooms in steamers, manufactories and workshops, as well as cellar doors, coal-scuttle holes, steps, &c., to take the place of castings. The latter weigh from three to four times as much, and it is believed that the steel plates will prove a great advance over the older form.

The Delaware Rolling Mill, at Phillipsburg, N. J., shut down on Monday, the 16th inst., owing to the scarcity of coal and the dullness in the iron trade. Three hundred hands were thrown out of employment.

No. 2 blast furnace of the Pennsylvania Steel Works, at Steelton, Pa., was banked on the 20th inst. This leaves but one furnace, No. 4, of the above company in blast at the present time.

No. 6 furnace of the Crane Iron Company, at Catasauqua, Pa., was banked on the 20th inst. on account of poor coal and low prices of pig iron.

It is said officially at the Navy Department that the Columbia Iron Works, of Baltimore, Md., are now paying \$25 per day for failure to complete the gunboat which they contracted to have ready for the Government on December 22. A strong effort is being made to prevail upon Secretary Whitney to waive the penalty and grant the company an extension of time to complete the vessel. The Department have not acted on the case.

Robert H. Coleman, of Lebanon, Pa., of the Colebrook, Cornwall, Anthracite and Lochiel furnaces, informs us that they are not affected by the coal strike from the fact that they use Wilkesbarre coal, which they receive via the Pennsylvania Railroad.

The first of the five furnaces in Sheffield, Ala., was blown in a few days since.

#### Machinery.

The Litchfield Car and Machine Company, of Litchfield, Ill., under date of the 19th inst., write us as follows: "We have just completed our new foundry in connection with our machine shop. It is fitted with a traveling crane and all of the latest appliances for handling heavy machinery. The building of this foundry has become necessary on account of the largely increased capacity recently added to our car

shops and the large increase of car work, which absorbs all the output of our old foundry for our car construction. The old foundry will now be turned into car manufacturing and the new foundry will be utilized for machine work."

The Universal Radial Drill Company, Cincinnati, Ohio, are shipping their well-known radial drills at the rate of two a week. Their new shops are now in practical running order and they are prepared to turn out their product rapidly.

Messrs. Lodge, Davis & Co., Cincinnati, Ohio, report a remarkable increase in the output of their productions during the year 1887 over that of 1886, the former being fully four times greater. The firm are now devoting the entire facilities of their old shops to the manufacture of engine lathes, while drill presses, shapers and other tools are being produced in adjoining buildings and extensions to their original shops, covering an entire square fronting on Sixth street and running back 150 feet on Culvert street and Eggleston avenue.

The wheelwright shop of the Rogers Locomotive Works, in Paterson, also the upper part of the machine shop, which was equipped with valuable tools, were burned on Monday morning. The loss on buildings and tools is estimated at \$50,000; fully insured. The most serious loss to the company is the interruption the fire will cause to their business, for, although only about 200 men are thrown out of work, the other 1600 will be delayed in their work. The origin of the fire is not known.

The Secretary of the Navy awarded contracts for furnishing tools and materials for the construction department of the Brooklyn Navy Yard, as follows: The Niles Tool Works, of New York, classes 7, 9, 10, 16, 21, 22, 25, 26, 27, 28 and 29, aggregating \$30,855; Robert Wetherill & Co., of Chester, Pa., class 49, at \$9700; Manning, Maxwell & Moore, of New York, classes 1, 2, 3, 4 and 8, aggregating \$9540; S. Forsaith Machine Company, of Manchester, N. H., classes 5, 6 and 17, aggregating \$9106; Bement, Miles & Co., of Philadelphia, classes 13, 14 and 15, aggregating \$7850; James W. Soper, of New York, classes 18, 19, 33, 34, 35, 36, 37, 38, 39 and 40, aggregating \$3007; the Putnam Machine Company, of Fitchburg, Mass., class 11, \$2753; Donegan & Swift, of New York, classes 12, 24 and 32, aggregating \$1201; Fraser & Archer, of New York, classes 41, 42, 43, 44, 45, 46, 47 and 48, aggregating \$1125; R. A. Robbins, New York, class 30, \$989; B. F. Sturtevant, of Boston, class 23, \$850—making a grand total of \$77,277.

#### Hardware.

We are in receipt of one of the calendars for 1888 issued by the Holly Mfg. Company, of Lockport, N. Y., and also of an interesting pamphlet, prepared by them, giving facts and figures relative to their pumping engines.

G. & H. Barnett, the Black Diamond File Works, Philadelphia, report that they turned out and sold more goods in 1887 than in any previous year, the increase over 1886 being very large.

The Shepard Hardware Company, Buffalo, N. Y., announce that they have purchased the patterns for Blind Hinges, Shutter Hinges, Gate Hinges, Frame Pulleys and Sash Cord Irons, together with letters patent, trade-marks, labels and good will relating to these goods, all recently owned by the Clark Mfg. Company.

The Cincinnati Wire Company, manufacturers of wire nails, report that although in operation but a little over 30 days have all the orders they can fill with their present capacity. They have under way 25 additional machines, which will be placed in position as soon as ready, and will give them a total complement of 75 machines.

#### Miscellaneous.

The Ensign Mfg. Company, of Huntington, W. Va., have recently received and are now at work on a contract from the Louisville and Nashville Railroad for 1000 freight cars of 60,000 pounds capacity. They will be 34 feet long and heavily built.

The Cramps, in Philadelphia, have just begun the construction of a dynamite cruiser of 700 tons for the Pneumatic Gun Company, of New York, which will carry three of these guns. The contract for the construction of a new iron steamship will be given this week to Philadelphia shipbuilders by the Bangor and New York Steamship Line. The new craft will draw not more than 10½ feet of water and steam 14 knots an hour, with a carrying capacity of 1200 tons.

The Southern Car Works, at Knoxville, Tenn., have recently received a contract to build a large number of box and flat cars for the Chattanooga, Rome and Carrollton Railroad. The largest coal hoist in the bituminous coal fields was made at Leisenring Shaft, No. 1, of the Connellsville Coke and Iron Company, on Saturday, the 14th inst. In the space of 9 hours and 24 minutes 2006 tons of coal were hoisted from the bottom of the 428-foot shaft, the deepest in the region. Of this time 18 minutes were lost in a broken car, otherwise the hoist would have been greater throughout the day. The coal was hoisted at the rate of 3  $\frac{88}{100}$  tons per minute, the coal being raised in one-car trips. The engines at these works are double, first motion, 24 x 48 inch cylinder, spiral drums coning from 7 feet to 10 feet.

A coal company of unusual magnitude has been incorporated at St. Louis, Mo., under the name of the Kansas and Texas Coal Company. The name is no index to the character of the corporation. Its articles of incorporation empower it to mine all kinds of minerals and ores, and refine, reduce, smelt, manufacture and sell them; also to buy, rent, lease and sell lands; also to manufacture and deal in coal, coke, brick, lime, cement, lumber and white lead; also to purchase and sell all kinds of merchandise; also to build any and all factories or buildings of whatever character necessary for any and all branches of business, and to carry on any other business for pecuniary profit or gain not inconsistent with the constitution and laws of the States of Missouri, Arkansas, Kansas and Texas. The company are an old one who have moved their headquarters from Springfield, Mo., to St. Louis, and have increased their capital stock to nearly three times its original amount. The object of this vast increase in the company's stock is to meet the additional expense incurred in the extension of their plant to more than five times its original size. The capital stock of the company, which is all paid up, is \$2,000,000, made up of 20,000 shares of stock at \$100 per share. The incorporators and board of directors of the company are Logan H. Roots, of Arkansas; George T. Sparks and Stephen B. Elkins, of West Virginia; F. E. Doubleday, of Kansas, and R. C. Kerens, S. E. Hoffman, Moses Rumsey, B. F. Hobart and E. B. Loveland, of St. Louis. Of the 20,000 shares of stock, 19,992 are in the name of E. B. Loveland, and others have one share each. Mr. Loveland is said to represent Mr. Hobart, who is the heaviest stockowner in the company.

The D. M. Steward Mfg. Company, of Chattanooga, Tenn., manufacturers of electric insulators, lava gas tips, rolling mill crays, &c., have reorganized under the laws of the State of Tennessee with largely increased capital, and have erected permanent factory buildings of large capacity at Chattanooga. They have also added a number of new machines which will largely increase their output.



## THE WEEK.

The steamship lines have advanced their steerage rates to and from all points in Scandinavia, except Stockholm. They are now \$27 and \$30.

A committee of the United States Trust Company are examining public buildings at Albany and elsewhere with reference to designs and materials for their new \$500,000 structure to be erected in Wall street.

The plumbing and sewerage work in the City Hall has been stopped until the plans shall be approved by the Board of Health, the Mayor insisting that the work shall be thoroughly done.

California has in warehouse a surplus of about 7,100,000 cents, or, say 355,000 short tons of wheat and flour, a little more than was exported during the half year just closed.

The French Ministers decide unanimously against M. De Lesseps's lottery scheme in aid of the construction of the Panama Canal, and, as the interest account already amounts to \$15,000,000 per annum, grave doubts are expressed whether the work can be continued much longer. A financial crash is hinted at as not improbable, in which the poorer classes in France, who have been tempted to invest their savings, will be the severest sufferers.

The Michigan Carbon Works, in Detroit, are reported to have lost \$50,000 through the speculations of its treasurer, Charles E. Young. The business of the company is peculiar and extensive. The works use a large quantity of bones, most of which are brought from the plains. The company contracts for its material with parties all along the lines of the Pacific railways from Manitoba to Texas, and about 4000 cars of bones are received yearly, and these coming from remote points, the freight bills are very large. Young, it is alleged, took advantage of this to hide his drafts on the company's funds by increasing the freight charges.

A Chinese commercial house has been established at Acapulco to supply Mexico with Asiatic goods.

The American pottery trade convened in Washington City a few days ago, and the president, H. S. Knowles, of East Liverpool, Ohio, in his annual address, claimed that Americans are making the best pottery in the world and at the lowest prices considering the cost of labor. The business is enlarged every year and new and improved methods are devised. The manufacturers object to having pottery put upon the free list.

Many of the farmers and lumbermen in Northern Michigan are making use of dogs this winter to draw their sleds. It is said that the dogs become very expert at the work after a little training, and in many ways equal the Esquimaux dogs.

Mayor Hewitt disapproves of the contemplated viaduct and arcade road on Tenth avenue.

A joint resolution before Congress appropriating \$50,000 to defray expenses of United States Commissioners to the Melbourne Exhibition was passed in the House by a strong majority. In support of the measure Mr. Rayner, of Maryland, said that Australia contained 3,000,000 inhabitants, to whom the United States was annually sending \$10,000,000 of manufactured products, and who were sending to the United States \$5,000,000 of agricultural products, leaving a balance of trade in our favor amounting to \$5,000,000. One of the few steamship lines of this republic recently sailed from San Francisco to New Zealand, and New Zealand paid it \$150,000 for carrying the mail. A few years ago the United States controlled the

carrying trade of the world. The colors of the republic could then be seen floating at the masthead in every port of every civilized government, and the American sailor was the recognized monarch of the sea. To-day its flag had virtually disappeared from the ocean. Great Britain owned 63 per cent. of the steam marine of the world, and France and Germany, and even Austria, are bidding for the commerce of mankind. He did not believe that ships created commerce, but he did believe that commerce created ships; and he further believed that expositions created commerce.

A large tract of land on the Harlem River front, and now under water, has been leased by the Elevated Railroad Company from the city on terms equivalent to the annual interest at 3 per cent. on \$200,000, the improvements to be made under the direction of the Dock Board.

There was spirited bidding at the auction sale of condemned Government stores at League Island last week. Among the buyers were Gill & Co., of Philadelphia, who purchased nearly all the old cannon; H. B. Hammel, of New York, who bought a number of the gun carriages; Dreifuss & Co., Martin Burke, M. J. Ash, D. McAvoy, Purves & Son, M. H. Gregory, Irvin Thomas, R. McCuen, T. H. Cooke, Jasper Grant, Edward Hobbs, W. S. Kirk and E. B. Streep.

The Federation of Trades Convention lately convened in Albany refused to co-operate with the State Workingmen's Assembly, similarly convened, and the latter organization charged the Federation with presumptuously assuming to be the only regular assembly.

The prevalence of insanity among cigarmakers in this city led to an inquiry by the President of the Board of Health, requested by Mayor Hewitt, to ascertain the actual facts. Mr. Bayles finds that from 1874 to and including 1883, when the law was passed forbidding cigarmaking in tenements the number of cases of insanity was 112, a yearly average of 11 $\frac{2}{3}$ , and from 1884 to 1887 51, a yearly average of 12 $\frac{1}{3}$ , showing an increase. Mr. Bayles points out that the average number of cases yearly among the cigarmakers increased since tenement work was abandoned. From all the information he can obtain he sees nothing objectionable in the business of cigarmaking in tenements.

The manufacture of cotton goods in New Orleans is no longer an experiment. Two mills there will be enlarged in their capacity, one of them increasing its capital to \$1,000,000.

In the Legislature of this State a bill has been introduced providing that a barbed-wire fence of three strands, with a wooden rail not less than 4 inches wide and 4 feet from the ground, shall be a legal fence, and rendering corporations liable for damages when a wooden rail is not provided.

The steamer Mary Powell, the "Queen of the Hudson," is being rebuilt for the third time, and is now at the works of Ward & Stanton. Her paddle-wheels will be something new. She made her fastest trip in 1882 between New York and Rondout.

The executors of the Mortimer estate in this city obtained another verdict of over \$20,500 damages against the Elevated Railroad Company for loss of rental value of property on the Bowery and Division street.

A special dispatch from Ottawa says that some of the leading Canadian industries created by the new policy of the present Government discriminating against American manufactures are suffering severely from overproduction. A prominent merchant reports a curious state of affairs

in Canadian knit goods. He says that the English Markets are flooded with Canadian products in that line which can be bought in England, shipped back again and the duty paid at a lower price than the nominal prices at which they were quoted to home merchants.

It is stated that the efforts of the Western National Bank of New York to get possession of the charter of the Mortgage Bank of the City of Mexico have been frustrated, and as supposed through the jealous opposition of British capitalists controlling banking institutions at that capital.

The reduced west-bound freight rates from Pittsburgh do not affect the special iron rates, which continue in force.

Experience with car stoves within the last week or two has been peculiarly unfortunate. A train was wrecked on the Boston and Maine road at Bradford and several persons were killed, but fire was not among the horrors of the scene. The train was not heated with steam from the locomotive, but the cars each contained a Johnson heater, and the shock of the collision with the water tank was sufficient to break the coil of pipe in the inside of the heaters and drench the fires with water, thus extinguishing the fire before the surrounding tinder was in a blaze. In three other instances the car stove had its victims. On the Union Pacific Railroad two cars were telescoped by a collision and burned by coals from the stoves which they carried. A boy who was held in the wreck was burned to death. In North Carolina a passenger train on the Chester and Lenoir Railroad fell through a trestle and the cars were consumed, happily without any fatal casualties. A car containing immigrants became detached from a train on the Southern Pacific, near Sumner, Cal., and afterward rolled down an embankment. "The stove was overturned," says the report, "and the car caught fire. Instantly everything was in a blaze. The terrified passengers tried to escape, but several were fatally hurt and others severely burned."

Detroit capitalists are organizing a company to build an electric system of railway from that city to Mount Clemens, 20 miles distant, to cost with its equipments \$250,000. It is proposed to locate a central station about midway between the two terminal points, at which the motive power for the entire system will be generated. There will be three electric motors of 50 horse-power each, a 200 horse-power generator with boiler and engines commensurate, and \$20,000 worth of  $\frac{1}{4}$ -inch copper wire conductors.

To show the alleged hardships of some of the coal mining corporations a statement has been published to the effect that there have been paid out to employees of the Reading Coal and Iron Company during the last 12 years over \$50,000,000, and that meanwhile the company have mined and practically given away 51,000,000 tons of their coal. Worse yet, they did not receive net money enough for the coal they sold to pay the miners, the mining operations of the company having resulted in a deficit during these 12 years of \$12,250,000. In other words, taking the statement of the company as correct, they have paid back to the miners the entire proceeds of the coal produced, and have lost \$12,250,000 more in going through that operation. Therefore, the new management declare that it is a very bad time to ask that they should increase the basis of wages, certainly beyond what is paid by other coal producing companies.

The statistics of last year's business at the New York Custom-House, which have recently been compiled by the officers of the naval department show a heavy increase in every branch over the business of

the previous year. There were 196,000 entries of merchandise, against 188,000 in 1886, and there were more than 400,000 invoices received, representing every commercial nation and involving much labor in computing the correctness of the weights, measures and values of the various foreign countries from which the importations were made. The customs receipts at this port for the year from all sources amounted to \$148,862,203.50, as against \$140,078,568.49 during the year 1886. At this ratio of increase the receipts for the present year will be more than \$160,000,000.

The National Board of Trade, lately in session at Washington, adopted resolutions asking Congress to amend the naturalization laws, so as to prevent undesirable immigrants from becoming citizens; to revise the National Banking laws; to provide for the refunding of the four per cents, at a lower rate of interest; to repeal the law compelling the purchase of silver bullion; to provide for bounties for American vessels; also to enact uniform postage laws. The next convention will be held in Chicago in November.

The British Columbia salmon trade for 1887 comprised 202,000 packs as compared with 163,000 packs in the previous year, and is the largest in a decade with a single exception. Fraser River was the principal source of supply and the United Kingdom the largest consumer. At only \$1.25 per dozen, the trade of last year shows a value of over \$1,000,000.

The *Financial Chronicle* publishes an exhaustive review of railroad earnings during the year 1887. It says: "Out of 110 roads that have made returns, but seven show smaller gross earnings than in 1886, the loss reaching only \$391,443, and the aggregate gain on the whole 110 roads reaches over \$44,000,000. This improvement is the more noteworthy, that it follows a heavy gain the previous year, the increase then on 93 roads amounting to \$30,064,512. Totals now are based on a larger mileage, but taking the December statement as a basis, the increase in that respect as between 1887 and 1886 is only 6 per cent., while the increase in earnings is 14 per cent." The principal reason for this very favorable report is found in the great industrial activity that has prevailed throughout the country.

Rathbone, Sard & Co., the large stove manufacturers at Albany, proposed to their employees that the firm retain 10 per cent. of the men's wages until the end of the year, the same to be forfeited in case of a strike by the men, or in the event of a lockout by the firm, the men to be paid 10 per cent. of their wages during the lockout. Since the facts were stated in these columns a week ago, the men have accepted the conditions.

The North Pennsylvania Railroad Locomotives are burning coal dust with success.

The United States Commissioners for the International Exhibition at Brussels have authorized Armstrong, Knauer & Co., of this city, to grant all demands for space up to the last moment, but exhibitors must have their products in the exhibition not later than April 15 next. After that date the committee reserves to itself the right to refuse them without redress of any kind. John Bigelow is the Commissioner-General.

The Orient Insurance building on Wall street covering two lots was bought by Eugene Kelley, the banker, for \$452,500. The structure will be made to conform in architectural appearance to the property adjoining, making an imposing edifice.

The American Shipping and Industrial League, at its sessions held in Washington City during the past week, adopted a resolution favoring the passage of an act providing there shall be paid out of the

Treasury to any vessel, whether sail or steam, built and wholly owned in the United States, engaged in the foreign trade, the sum of 30 cents per registered ton for each 1000 miles sailed, and pro rata for any distance traveled less than 1000 miles, on any voyage or voyages between this and any foreign country or countries. The payment shall continue for the term of 10 years, and thereafter for another term of nine years at a reduction of 3 cents per ton each year upon each 1000 miles sailed, and pro rata for any less distance traveled. It was also resolved that the United States mails ought to be carried between this and foreign countries in American ships.

The New York State Factory Inspectors in their annual report, say that the laws generally are well enforced and make several recommendations, among others one relating to the inspection of steam boilers and the examination of stationary engineers.

The New York tax roll for 1888 assesses a value of \$1,254,491,849 on city property, against \$1,306,310,133, last year's valuation, an increase of \$51,818,284.

The first steamer of a new line, the vessels of which are to be fitted with tanks to convey petroleum from the United States to Europe, has been launched at Greenock.

The New York Post Office last year handled nearly 8,000,000 pieces of mail matter, and the total weight of mails received was 229 tons, an increase in five years of over 69 per cent. The weight of postage stamps sold was 12 tons.

Last year 1,000,000 boxes of window glass were imported, and the imports increase every year. Freight rates from Liverpool and Antwerp are as cheap as they are from Pittsburgh to New York City.

A Congressional Committee authorized to investigate all trusts affecting coal, sugar, mining and other industries is favored by the House Committee on Manufactures, and may in due time be heard from.

The French Government arsenals have suddenly become active, and all available iron-clads and cruisers are being put in fighting order. Germany and Russia are also stirred by warlike preparations.

The mammoth scheme of the Standard Gas-Light Company for the supply of a considerable portion of New York City with illuminating gas is being rapidly developed. Since May last the company have laid and tested 68 miles of pipe, and the design is to lay 500 miles of pipe during the coming five years. Land has been acquired in various parts of the city, from the Battery to the Harlem River, of sufficient extent for the erection of six stations, with a combined daily capacity of 20,000,000 cubic feet, together with seven smaller sites in convenient localities for storage tanks to equalize the general distribution. The bulk of this property has a water frontage upon either the North or the East River. The storage tanks will be about a mile apart, but will eventually form one continuous system for gas distribution throughout the entire city. The first of the system, on the East River side, up town, is nearly completed. The president of the company, W. C. Andrews, who is also president of the New York Steam Company, speaking of the advantages possessed for the manufacture of cheap gas, said: "Our process of manufacture will utilize cheap petroleum to produce a high candle-power gas. Next, steam, which is the basis of all so-called water gas, will be supplied from the boilers of the New York Steam Company. We have a contract with this company by

which we will receive steam at less cost than we could manufacture it from our own boilers. This obviates the necessity for extensive boiler houses. Now, add to these economies the 15 per cent. we will save in the matter of leakage through the tested wrought-iron pipes, and you will have our system down pretty fine. Again, as to the pressure. The natural pressure of gas in cast-iron pipes is about 2 ounces to the square inch. Our artificial pressure will be 1 pound and upward. Although the first cost of our plant is greater than that of cast iron, we will thus be enabled to do as much service with our 6-inch as the other companies do with their 16-inch pipe. We expect gas to rapidly supersede coal. Even at \$1.25 per 1000 feet it will prove a formidable competitor with coal at \$5 a ton. The price of gas in New York will gradually become lower."

It is stated that the Standard Oil Company will at once begin work on extensive oil docks at Duluth, making that city the general Western headquarters of the company.

The blizzard in the Northwest is said to have demonstrated thoroughly that the system of heating coaches by steam is practicable, and that in the coldest weather it can easily keep the temperature of the cars very comfortable. A special train on the Chicago and Northwestern, with several leading railroad officials aboard, encountered the blizzard out on the prairies, and while the thermometer dropped to 19° below zero, the temperature inside the cars was maintained equably at 70°. On both the Pennsylvania and Vanderbilt lines last week the steam heaters kept the trains quite comfortable.

The rise in the value of tin plate, lead and spelter, due to the corner in copper, will have a bad effect on the canned fruit pack of California this year. To the increased cost of cans will be added higher price of fine granulated sugar for syrups.

The British steamer *Miranda*, which failed in the attempt to tow the great log raft from Nova Scotia to this city, was seized by the United States marshal on Saturday, to secure a claim for \$44,000 as indemnity for breach of contract. It is alleged that the defendants were delinquent in several important particulars, not only in going to sea two weeks after the time stipulated, but in neglecting to use the means necessary to success in the undertaking.

The efficacy of steamship lines in fostering trade with foreign countries has a signal illustration in the trade between New York and Venezuela. The American consul at Maracaibo says that since the establishment of the line in 1880 "the steady and gratifying increase of our trade seems to warrant the belief that this is the chief factor for the extension of our commerce."

A bill appropriating \$1,125,000 for three composite bark-rigged steam vessels has been introduced into Congress, with the object of supplying training ships for seamen. The limit for each vessel, of about 900 tons displacement, having engines making at least 13 knots an hour, and rigged, armed and provided with sails, is \$375,000. A second bill calls for two more composite vessels, not exceeding 1000 tons displacement each, which are to be loaned to the cities of New York and Philadelphia, for use as nautical school ships.

In Des Moines River, Iowa, famous as a piscatory resort, the fish retreated before the freezing waters of the upper streams in such numbers that the mill-wheels at Bonaparte became blocked, making it necessary to open the race wickets, that the obstruction might be removed, although the water was from 10 to 12 feet deep.



Foreign Markets.

EQUIVALENTS.	
Franc, Peseta or Lira.....	19.3
Florin (Netherlands).....	10.2
Florin (Austria).....	35.9
Milreis (Portugal).....	\$1.08.
Milreis (Brazil).....	54.6
Mark (Germany).....	25.5
Pounds.	
Kilogram.....	220.5
Picul.....	134.

GREAT BRITAIN.

SCOTCH PIG IRON IN 1887.

The year began with hopeful anticipations of a large American demand, considerable contracts had been entered into for new and old material.—Rails, Scotch Special Brands, Hematite Iron, &c., &c., but the Continent and other parts of the world did not respond. Our local trade also continued depressed, and it was not until within the last few months that a change was noticeable, the large stocks in Messrs. Connal & Co.'s stores acting as a drag upon any upward movement. The attention of speculators was attracted to Pig Iron, after the rapid advances had taken place in Tin and Copper, and speculation of a very widespread character was stimulated by President Cleveland's message to Congress advocating sweeping reductions in the tariff—this, combined

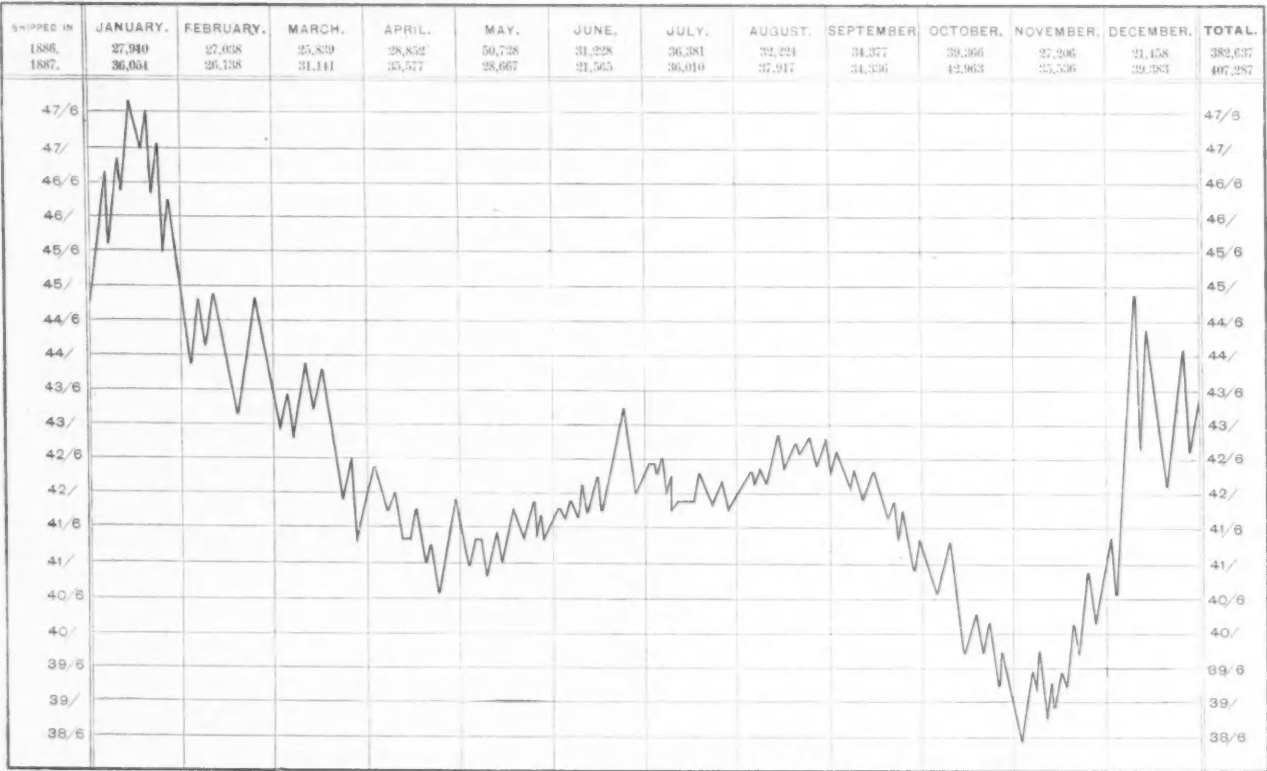
many years past, doubtless fostered by the great rise in Tin and Copper, and the spurt in the shipbuilding trades—and up to 44/10<sup>1</sup>/<sub>2</sub> was paid on the 12th. Extensive re-selling took place, the price quickly receding to 42/1, accepted on the 20th, recovering, however, to 44/1 on the 27th, after the publication of the Ironmasters' Returns, which were considered satisfactory; but the tide of speculation was checked for the time being by the disquieting rumors from the Continent, and realizing sales were made down to 42/7, the year closing, however, at 43/4<sup>1</sup>/<sub>2</sub>—the average price being 42/3, against 39/11 last year.

PRODUCTION.—Has been steady, the only interruption being a few weeks in February and March, on account of the miners' strike. The year began with 75 furnaces in blast of all classes, reduced to 61 in the last week of February, increased to 87 in December, closing with 85—the average being 80, against 83 last year; yielding a total production of 932,240 tons, against 935,801 tons—showing a decrease of 3561 tons. The average production per furnace per week this year has been 224 tons, against 216 tons last year; the larger quantity resulting from a greater number of furnaces being employed in making Hematite Iron—only those having the latest improvements were kept in operation. The increasing demand for Steel has caused our ironmasters to employ more of their furnaces in making Hematite Iron—the average being 18, against

ers' yards, but with a large one in Messrs. Connal & Co.'s stores of G.M.B. Pig Iron; but Monkland with six, and Quarter with five furnaces having ceased to make Pig Iron, the quantity of G.M.B. available will henceforth be considerably reduced. The heavy cloud of depression which has so long hung over the commercial world is showing signs of disappearing; ample proof is given of this in the extensive shipbuilding contracts entered into by our great passenger-carrying steamship lines, and by those engaged in general cargo trades. Work is now assured in this district for many months to come, with its increased consumption and employment of labor. America continues in a prosperous condition, and although her Pig Iron production was increased during the year about 400,000 tons, she took more Iron from us than she has done for several years past, and the tendency to reduce the heavy tariff levied upon many commodities is a hopeful sign of an expansion of trade with this country. The advance in colonial and foreign produce, wool, sugar, &c., the increased railway traffics and Board of Trade returns all indicate a return to better times; and, with those important factors at work, it is reasonable to expect a further development in the coming year.—*Bost & Turner, Glasgow, Annual Circular.*

ENGINEERING TRADES IN 1887.

Trade has continued to improve during the last three months; there has been a marked in-



FLUCTUATIONS OF SCOTCH PIG IRON, BY JAMES WATSON & CO., GLASGOW.

with the placing of numerous shipbuilding contracts throughout the country, and the improved tone in general business led to a smart rise in values, with rapid fluctuations. M/nos Warrants opened in January at 44/10<sup>1</sup>/<sub>2</sub>, quickly advancing to 47/8 on the 12th—the highest price for the year—but as the spring wore on the hopeful anticipations were not realized, and prices slowly receded until April 21, when 40/6<sup>1</sup>/<sub>2</sub> was accepted, gradually improving again on the strength of increased American purchases, and 43/3 was paid on June 24, remaining quiet in July, August and September, the price only fluctuating between 42/9 and 41/9. October was depressed by continued large deliveries into Messrs. Connal & Co.'s stores and small shipping returns. Heavy selling took place, and down to 38/5<sup>1</sup>/<sub>2</sub> was accepted for Warrants on November 3, the lowest price touched during the year. From this point a decided change took place. The low prices ruling for Hematite Pig Iron caused the Cumberland ironmasters to consider the advisability of curtailing their production, which was ultimately agreed upon on November 17; the reduction was estimated to be over 5000 tons per week. Warrants became agitated and irregular. There was extensive buying to cover oversold accounts, resulting in a smart advance to 41/5 by December 1. A few days later, when the tenor of President Cleveland's message to Congress on the tariff question became known, a speculate wave set in from the South such as had not been experienced for

16 last year and 13 in 1885. The product of those furnaces continues to be mostly consumed in the district. The average wage of miners has again been about 4/ per day. EXPORTS.—The shipments, foreign, show an increase of 50,949 tons over last year, which has gone principally to the United States and Italy. To the latter country extensive shipments have been made during the last few weeks to escape the 8/ duty to be imposed on 1st January. The Continental demand generally has been quiet all the year. The coastwise shipments show a decrease of 26,299 tons. STOCKS.—The Ironmasters have issued complete returns of production and stocks. The total stock is now 1,228,040 tons, against 1,183,039 tons last year, an increase of only 45,001 tons, as against 132,356 tons last year. MANUFACTURED IRON AND STEEL.—Low and receding prices ruled until near the close of the year, when a smart advance took place. Steel for shipbuilding (two-thirds Plates and one-third Angles) was quoted in January about £6. 5/, in November £5. 12/6, advancing in December to £6. 15/, while Iron Plates in January were quoted £5. 5/, in November £4. 15/, improving to £5. 10/. Bars were £5. 5/ in January, £4. 10/ in November and about £5. 5/ again in December. There has been an extensive business done in English Hematite and Middlesboro' warrants in our market. The rapid development of the Steel trade has caused the former to be held in special favor by speculators. We enter the year with a small stock in mak-

crease in the value of exports, and in most branches of engineering the prospects for the opening year are favorable. The introduction of late years of automatic and labor-saving machinery has much to do with the low prices that prevail, for while the volume of trade has increased the producing power of the country has grown still more rapidly. The revival must, to some extent, be associated with that in the United States which preceded it, and this great activity in America, where, during the past year, more than 10,000 miles of new railway have been constructed, seems likely to continue. There is no immediate prospect of any reduction in the tariff as seemed foreshadowed by the President's message to Congress, and this postpones a serious and possibly overpowering competition with Great Britain, which will arise directly the removal of protective duties in the United States brings the cost of living and, therefore, that of production, to a normal level and allows full development of the enormous natural resources of the country. IRON.—The sudden and great rise during the last three months in the prices of Copper, Tin and other metals gave the stimulus which alone was wanting to an advance in the values of Iron and Steel, which had continued to fall after the issue of our July report. This advance has been supported by a genuine growing demand, as well as by the speculative dealings of those anticipating a further rise, but the large stocks of Pig Iron and the producing capacity available render any but a slow move-

ment unjustifiable. The quantity of Pig Iron manufactured in Cleveland in 1887 was less than in 1886, but the difference was more than made up by the increase in the quantity of Basic Pig or Steel made in the same locality. Rolled Iron has for a considerable time been selling at prices hardly repaying the deterioration of the plant producing it, and the slight improvement in price is rather a reflection of that in Steel than due as yet to any increased demand. If, however, the consumption does grow, the reduction of late years in the number of puddling furnaces would now assist in an improvement of prices. High-class Yorkshire Iron of the Farley or Lowmoor type suffers most from the rivalry of Steel, and it is likely that the future of such Iron will lie rather in the direction of Bars for various smithing purposes than as heretofore of Plates for flanging and other severe treatment.

STEEL has risen in price, this being partly due to the advance in Cumberland and Spanish Hematite Ore (the latter because of higher freights from Bilbao), but in the case of Plates and other structural material to the greater demand. The revival of the shipbuilding industry has had a direct and immediate effect, but it is yet to be seen how far the enormous productive power, now equal for Plates alone to about 10,000 tons per week, will keep prices from advancing further. The Rail trade has been only moderately active during the last six months; some large colonial and other orders have just been placed, but at present the prospects for the new year are not well assured. The hoped-for demand from the United States has been checked by the fall in prices there, where there is a combined action among Rail-makers to meet European competition, notwithstanding the rise in prices in that country of all other engineering material. Nearly 2,000,000 tons of Steel Rails have been made in America during the past year. An increase of exports seems likely from Great Britain to the Southern States and to the Pacific Coast, where cheap ocean freights allow sea-borne Rails to compete with American products. In Sheffield the prices of Tires, Springs and other more expensive forms of Steel are also rising in sympathy with the general advance. The following list shows the fluctuations in values during the last year:

	Jan., 1887.	July, 1887.	Jan., 1888.
Pig Iron at Glasgow, No. 3	£ 2 4 6	£ 2 6 2	£ 3 0
Pig Iron at Middlesboro', No. 3	1 14 0	1 14 6	1 13 6
Iron Ship Plates at Middlesboro'	4 12 6	4 12 6	4 15 0
Iron Bridge Plates in South Yorkshire	5 7 6	5 7 6	0 0
Steel Ship and Bridge Plates	6 5 0	6 5 0	0 0
Steel Rails, f.o.b.	4 5 0	4 3 0	4 3 0

SCRAP IRON AND STEEL.—Prices are, as usual, largely influenced by the condition of trade in the United States. There is little doing or promising with the Atlantic ports, but there have been considerable shipments of Scrap to San Francisco at 46/ @ 47/, f.o.b. Holders of Old Iron Rails will not sell at the prices, \$21, duty paid, ruling in New York, equal to about 56/, payable here for cost, freight and insurance. Italy has been the best customer during the last few months, there having been large shipments thither of Old Rails and other Scrap, but at present the demand has ceased pending the decision of the Italian Government as to a proposed additional duty of 10 lire per ton. The prices of mixed sections of Old Iron Rails for Italy have been from 67/ to 70/, inclusive of freight, ranging from 10/ to 13/.

IRON AND STEEL SHIPBUILDING.—A marked recovery has taken place during the last few months from the depression of the preceding three years, and this improvement is the most significant sign that a general revival has at last commenced in the engineering trades. In Scotland shipbuilding reached its maximum in 1884, when nearly 500,000 tons were launched; freight rates rapidly fell under the increased competition of shipowners, and in 1886 less than 200,000 tons were built. Although the recovery has come too recently to influence much the statistics of the year just closed, the contracts entered into since September aggregate a greater tonnage than has ever been given out in a similar period. Steel has at last entirely superseded Iron as a material of construction for steamers, for while in 1879 only 10 per cent. of the total vessels built were of Steel, in 1887 the proportion was 80 per cent., and the remainder was almost entirely sailing vessels. In Boilers the same revolution has taken place; Steel allows the higher pressure of steam, which is essential to economy of fuel, and further progress in this direction is going on. Triple expansion has been successful

with steam at 150 pounds pressure, but the same principle, carried out by quadruple expansion will be still more advantageous if an initial pressure of 200 pounds be given in the first of the four cylinders. This is likely to be the maximum till invention takes a new departure.—*Matheson & Grant, London, January 2.*

#### EAST INDIES.

SINGAPORE, December 5, 1887.—*Tin*.—During the fortnight under review the price advanced rapidly to \$59.75 per picul, at which a large business was done, but a complete collapse has since taken place, and we close with no buyers at \$51. Supplies are being hurried to market, anticipating the usual rush at the Chinese new year, and the effect of this will be visible in smaller supplies later on. *Tonnage*.—Rates to London by steam tend downward. For New York via Cape the Oneida continues her loading; for Boston the Jenny Parker loads for charterers' account. *Exchange* is quoted 3/2½ for six months' sight credits. Shipments from the Straits Settlements to the United States during the first 11 months have been as under: 1887, 69,570 piculs; 1886, 66,873; 1885, 37,058; 1884, 55,279; 1883, 106,231, and 1882, 104,395.—*Gilfillan, Wood & Co.*

MANILA, January 2, 1888.—*Hemp*.—Fair current may be quoted £31.17/ cost and freight, to England. Receipts since the 1st inst. sum up 3000 bales; there are loading for England 3000 bales per steamer and 3000 per sailing vessel; for the United States, 12,000. *Exchange*, 3/3.—*Smith, Bell & Co.*

COLOMBO, December 8, 1887.—*Plumbago*.—Our market has been quiet but firm at ensuing quotations in rupees per ton: Large Lumps, 145; Ordinary ditto, 115 @ 145; Chips, 80 @ 90, and Dust, 40 @ 60. *Coir Yarn* is worth 7 @ 12 rupees per cwt., No. 1 to 4. *Ebony*, 80 @ 100 rupees per ton. Plumbago shipments since October 1 have been as follows: To England, 23,433 cwt.; to Marseilles, 38; to Antwerp, 707; to India, 62, and to the United States, 23,761. *Exchange*, six months' sight, 1/5½.—*Volkart Brothers.*

#### CHILE.

VALPARAISO, November 25, 1887.—*Copper*.—Has been but sparingly offered in consequence of the rising tendency in London, sales being limited to 28,250 quintals at \$23.40, which, with 27/6 freight, equals £57. 3/9. *Nitrate*.—But little has been done; a few cargoes, October-November shipment, with tonnage guaranteed, were sold at \$2.73¼ @ \$2.75 for 95 %. The more distant futures are rather neglected; Refined, for January, has been paid \$2.85, and February at \$2.75 for the United States. For February and March \$2.50 have been offered in vain for 95 %. Total sales so far, 315,500 quintals at \$2.62¼ for 95 %, which, at 26/3 freight, equals 7/8½ per cwt. in England, the exchange being 25½d. During the fortnight the charters amounted to 19,000 tons for Europe and 2000 for the United States. October shipments reached 1,960,738 quintals, and at the close of the month 2,561,764 were loading. Nitrate shipments since January:

	1885. Quin- tals.	1886. Quin- tals.	1887. Quin- tals.
To the North of Europe	5,393,924	5,534,441	9,124,010
To the Mediterranean	41,930	128,057	210,541
To the United States on the Atlantic	770,096	1,206,137	1,279,961
To the United States on the Pacific	68,739	237,369	186,296
Totals	6,274,689	7,106,004	10,800,808

Coal.—Is in speculative demand at 30/, Newcastle. *Exchange*, 25d.—*Weber & Co.*

#### FRANCE.

PARIS, January 14, 1888.—*Metals*.—A reaction having set in against extreme Copper and Tin prices, we have to reduce quotations for the same to the ensuing figures, in francs per 100 kg.: *Copper*, Chili Bars, 210 @ 214.25; Ingots and Slabs, 207.50; Best Selected, 210; Banca Tin, 425; Billiton and Straits, 437.50; Australian, 440, and English, 387.50 @ 410; *Lead*, 40 @ 41, and *Spelter*, 54.50 @ 56. *Iron*.—In view of the rise in Coke and Pig in the north of France, our dealers have advanced iron prices ½ franc in this city to 13 francs per 100 kg., Beams, and 14, Merchant, while Old Rails are firm at 8 francs. All Northern rolling mills are very busy. In the Ardennes foundries are getting on swimmingly, and appear on the eve of raising prices. Carriage and other Hardware report more favorably, and so do the rolling mills at Longwy. In the Haute-Marne machine shops are in a flourishing condition. In other words, as a general thing the year opens under most encouraging circumstances in France in the Iron and Steel line.—*Moniteur des Interets Materiels.*

#### GERMANY.

HAMBURG, January 14, 1888.—*Iron*.—The feeling so far in the new year is one of great hopefulness in Rhenish-Westphalia. Spiegel continues doing well at home, less so high percentage for export, not bringing over 51 @ 52 marks. Good quality Forge Pig is in active request for the second quarter at 49 at Siegen, and 50 at Dortmund. Foundry, Bessemer and Thomas are also in active demand, more so than heretofore. Rolling-mill owners are warning blast-furnace owners not to push the price of Pig too much, since it would spoil the sale of Finished abroad, and thus recoil upon themselves. Meanwhile Finished is doing very well. Till March 1 next the entire make is provided for. Merchant is selling rapidly for domestic consumption, but prices are out of proportion low compared with those of Pig. It is all sold till April 1, while the price still remains 122.50 @ 125. Hoops have improved to 137.50 since makers joined the convention. Boiler Plates have been raised to 160, an advance of 10 marks, there being an increased inquiry. Thin Sheets are lively at 148. Wire rods are unaltered at 115 @ 116; Drawn Wire, 130; Wire Nails may be quoted 145. Steel rails have latterly ranged between 125 and 130. Car works are satisfactorily booked, with new adjudications for 37 passenger and 75 freight cars. Foundries and machine shops have no reason for complaint except, perhaps, that their business might be more remunerative. In Upper Silesia, Forge Pig is getting scarce; makers there are waiting an answer to their offer to sell their output all the way to 1891 to local rolling mills at 50 marks. The German rolling mill syndicate is now negotiating with the Belgian for a common convention. The Wire branch is in an enviable position in Upper Silesia, with plenty of orders for the opening of river navigation. *Metals* are firm. We quote German Lead, 15.50 @ 16.25; Copper, 83 @ 85, and Spelter, 21 @ 23.—*Borsenhalle.*

#### BELGIUM.

BRUSSELS, January 14, 1888.—*Iron*.—The new year has been inaugurated under favorable circumstances after winding up a satisfactory business in the old one. Any amount of new business is in treaty with foreign countries for railroad material, beams and other rolling mill products. Beams are bringing 11.50 francs per 100 kg. and sheets, 14.50. Both Forge and Foundry Pig are firmly held, the tendency being upward. Most of the rolling mills have made contracts three months ahead. Steel works, though busy, are not quite so fully engaged as they might wish. Steel Plates, at the last adjudications of the Government, were held so high by domestic makers that Krupp came in for a chance to some extent. Among the distant countries coming forward with fresh commands so early in the year, China and Japan should be mentioned, Charleroi receiving the bulk of these orders to commence with.—*Moniteur Industriel.*

#### NORWAY.

CHRISTIANIA, January 11, 1888.—*Copper*.—While this metal was low in price, Copper production made but little headway in Scandinavia. Swedish exportation did not exceed 253 tons during the first eleven months of last year; during the corresponding period in 1886 it had been 103 tons. Since the rise in Copper the Roeros Copper Mines in Norway have, however, been taken in hand most vigorously, and the works connected with them will be considerably extended this year. The yield will be sold at auction in small lots. Some copper was placed in this manner at Drontheim on the 7th instant.—*Dagbladet.*

#### SPAIN.

BILBAO, December 31, 1887.—*Iron Ore*.—Some fine contracts have been made during the week, among others one for 20,000 tons Rubios at 7/. With the Campanil Company some have also come to pass at 7/6 @ 8/. For aught we know some few lower contracts may have been made, but it is difficult to procure ore at rates below those above quoted. On the contrary, the asking rates at the close are 7/ @ 7/3 Rubios and 7/9 @ 8/ Campanil. Exportation during the week has been quite brisk. The total shipments in 1887 have reached 4,170,423 tons, against 3,160,047 in 1886. Export of ores and metals from Spain during the first ten months:

	1885. Tons.	1886. Tons.	1887. Tons.
Calamine	31,400	22,497	21,473
Pyrites	689,143	574,285	650,535
Iron Ore	3,327,216	3,474,446	4,615,245
Pig Iron	13,661	44,532	94,619
Precipitate	22,881	23,378	23,825
Quicksilver	1,002	541	1,122
Pig Lead	97,981	94,097	111,357

Totals.....4,183,284 4,233,776 5,518,176  
—*Bilbao Maritimo y Comercial.*



## WASHINGTON NEWS.

(From Our Regular Correspondent.)

WASHINGTON, D. C., January 24, 1888.

The Committee on Ways and Means are still engaged in nightly sessions on their proposed revenue reduction tariff bill, but are making progress slowly. It was expected that the measure would be introduced in the House this week, but the indisposition of Chairman Mills, and the illness of Speaker Carlisle, have caused delay. When the bill will be ready is now purely speculative. There are those who are disposed to think that no bill will be reported, owing to threatened disagreements among the Democratic members of the committee on the internal revenue feature. This, however, is an ultra view of the subject, as some agreement will be reached on a bill of some kind. The prospects, however, of passing a bill are exceedingly slim.

The contest in Pennsylvania over the chairmanship of the Democratic State Committee was drawn on the lines of the President's message on one side and Mr. Randall's protective idea on the other. The Randall candidate went under by the small margin of seven votes out of 79. The champion of the Administration side was Representative Scott, of Erie, the millionaire coal operator, member of the Committee on Ways and Means and personal friend of the President, and whose avowed belief in free iron, ore, coal, salt, lumber and wool is well known. The success of the free trade advocates in capturing the party organization in Pennsylvania it was thought would curb the influence of Mr. Randall, but so far from having that effect it has only stimulated him to increased energy. He will now insist upon a bill according to his idea of adjusting duties to existing conditions, the protection of home labor and the repeal of the tax on manufactured tobacco and so far as immediately practicable all the internal revenue taxes.

Captain Phythian, Chief of the Bureau of Steel Inspection, has just returned from Pittsburgh, having gone there to witness the casting and to examine the results on the steel gun. He says that the casting which was undertaken by the Hainsworth Pittsburgh Steel Casting Company was a great success. The gun was perfect and the material tested was in every respect satisfactory as regards scientific tests. He says if the practical test of the gun is in keeping with the mechanical execution it will greatly simplify ordnance manufacture.

The House Committee on Manufactures have been considering their bill to prevent the forming of combines to force up prices. A proposition has also been submitted to suspend the duties on steel rails for 60 or 90 days. They disclaim jurisdiction on such questions, as matters of revenues belong exclusively to the Committee on Ways and Means. In both the Senate and House the talk about the suspension of the duties on steel seems to find many advocates, and if brought fairly before the two houses would stand some chance of adoption. The free-trade Democrats would sustain it, and the Western Republicans in States prominent in railroad development would be disposed the same way. This subject just now is more interesting than the tariff. It would also, in a measure, be passed under the pretext of revenue reduction.

The Interstate Commission at Washington, D. C., has rendered a decision in the case of Riddle, Dean & Co., who charged discrimination on the part of the Pittsburgh and Lake Erie Railroad in refusing complainants their proportion of cars for the transportation of coal. The opinion says that as the railroad company was unable

for a brief period to furnish promptly all coal cars demanded for the movement of freight over their own line, it was the duty of the company, as they did, to furnish cars ratably and fairly to all the mines along the line in proportion to their freights until the emergency had passed, when it could move all their freights as tendered. The complaint was dismissed.

Another stage has been reached in the prosecution of the Lambert & Bishop Wire Fence Company, of Joliet, Ill., by the insurance companies. Failing to win their suit to recover insurance money which they alleged had been secured through the criminal action of the officers of the wire fence company, the representatives of these insurance companies attempted to have Messrs. Lambert & Bishop and Superintendent Whyte indicted for arson, claiming that the last-named had fired the works in compliance with instructions from the others. On the 19th inst. the grand jury reported that they had failed to find a true bill against the parties. Messrs. Lambert & Bishop have been congratulated by their friends over their second victory in these highly sensational proceedings, while, on the other hand, the representatives of the insurance companies are chagrined over their defeat, but promise developments of a grave character, although they do not specify their nature. It is highly probable that nothing further will be done on their part, as they have been so signally defeated in everything they have undertaken, but the wire fence company will hardly let the matter rest without attempting to secure a thorough vindication.

The residents of the Mississippi Valley take very properly a deep interest in everything affecting the navigable condition of the Mississippi River. A number of conventions have been held in recent months to take action on some phase of the question, with a view to influencing Congress. Another was held at Dubuque, Iowa, on the 17th and 18th insts., composed of representatives of the business interests of Iowa, Illinois, Wisconsin, Minnesota and Missouri, so far as they are affected by the navigability of the upper Mississippi. Resolutions were adopted to the effect that the National Government has failed to provide appropriations for the improvement of that part of the river, thereby depriving the people of the section through which it runs of a cheap and safe water route to the seaboard, so that an imperative necessity now exists for Congress to take prompt action for the relief of the interests involved. The convention was numerously attended by prominent citizens of all shades of political belief, and the general sentiment prevailed that results of benefit would accrue to the business interests of the Mississippi Valley.

The experiment adopted two years ago at St. Louis by the N. O. Nelson Mfg. Company of sharing all profits over 7 per cent. of their capital invested with their employees has proved a success, \$30,000 being so distributed on the 13th inst. as the employees' share. After the per cent. profits are deducted 10 per cent. of the balance is set aside for a guarantee fund to cover losses in bad years, 10 per cent. to form a sick benefit fund, and the rest is divided between the stockholders and employees in proportion to the capital stock and total wages for the year. Most of the 200 employees are also stockholders, and share in both. The wages paid are the highest paid elsewhere. N. O. Nelson, head of the firm, thinks he has solved the labor problem. The employees of this company are more than usually intelligent. Most of them are skilled mechanics, and the fact

must be recognized that with such a class of men a scheme of this character would have its best chance of success. Under ordinary conditions there is far less probability of labor troubles among highly-skilled workmen than among those removed but a degree or two from the condition of ordinary laborers.

An interesting calculation of the comparative cost of living in this country and in Great Britain has just been completed, based on the investigations of Carroll D. Wright, of the Massachusetts Labor Bureau. The following table is compiled from the *Tariff League's Bulletin*, and the prices are for 1883:

	Great Britain.	Mass.	Inc. cost here.
Groceries.....	30½	35¼	5¼
Provisions.....	23	19	*4
Fuel.....	3½	6½	3¼
Dry Goods.....	3½	3½	*1½
Shoes.....	3½	4½	1¼
Clothing.....	10½	13½	2¾
Sundries.....	12½	10½	*2¼
Rent.....	12¾	24¼	11¾
Total.....	100	117	17
Wages.....	100	177	77

\*Decrease

This shows that in 1883, for every dollar paid by English workmen for living expenses, American workmen in Massachusetts paid \$1.17, while they received in wages \$1.77 to every \$1 paid the English workmen. If the item of rent is excluded, the difference in the cost price of actual living here in 1883 was only 5½ per cent. higher, and it has decreased materially in the past four years because of lower prices for clothing and provisions. These figures tend to prove that, with an average rate of duty of 42½ per cent. on goods entered for consumption, a man can clothe and feed his family here for less than 5 per cent. above the cost in England and earn \$1.77 for every \$1 he would receive abroad.

The State of Ohio is preparing for her great centennial exposition to be held at Columbus, next September and October and to which all prominent men in the National and State Governments will be invited. Spacious exhibition buildings have been erected, of which several will be exclusively devoted to machinery and labor-saving devices. Ohio claims to be among the foremost in manufactures of all kinds, and in the number of workmen employed, in the number of establishments, value of material and products of iron and steel, and blast furnaces, rolling mills, Bessemer and open-hearth steel works and many other important particulars.

The Bradford oil field in McKean County, Pa., has produced since the beginning of the oil discoveries 140,000,000 barrels of crude petroleum, and is the richest field in the United States. The first considerable development was in 1875, when about 25,000 barrels were produced. Next year the product was 380,000 barrels, and in 1877 1,420,000 barrels. At this last date there were but 10 producing wells in the Bradford field; now there are 15,000. The greatest yearly output was in 1881, with 23,000,000 barrels. In 1882 it dropped to 18,000,000, and last year the total was 7,700,000. The amount of capital invested in the production of this field is placed at \$100,000,000, which does not include the elaborate pipe line service nor the iron tankage necessary to store the oil.

An extraordinary feat in telegraphy was accomplished the 23d inst., when an interview took place by cable between London and Vancouver, through lines of wire equal to 7619 miles. A reply was received within six minutes from the Pacific side after the conversation began. The messages outstripped the sun by eight hours.

# TRADE REPORT.

## British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, January 25, 1898.

The "bear" interest in the Pig-Iron market has continued to sell with more or less freedom. Warrants have ruled quite irregular in consequence and prices for makers' Iron have been affected in some degree. The consumption is still on a large scale, but this fact is offset to a great extent, in the opinion of speculators, by the tendency toward increased production. Reports the past week indicate enlarged output in several districts. Scotch warrants have fluctuated between 40/6 and 41/4, closing at 40/9 today, and makers' brands are generally about 6d lower. Middlesboro' Pig is a trifle easier, but Bessemer steadier.

There is still an active demand for various descriptions of Steel, and prices are very firm on nearly all lines, with Plates relatively strongest. Inquiries have been larger than during any previous week this month. Steel Rails have improved somewhat on last week's prices, with moderate sales.

Manufactured Iron also continues to sell very freely and the general market retains a firm tone. Prices are strongest on Best Bars and Black Sheets. The proposition to include the Pig-Tin syndicate in the Tin-Plate combination has evidently been abandoned—for the present at least. The latest report, at all events, is that the Tin-Plate makers have decided to work free-handed for mutual interest, and that they have rejected overtures made by the Tin syndicate. The Rio Tinto plan evidently is not favored. Whatever the ultimate outcome may be it is certain that the market developed additional strength the past week, although reports this afternoon state that sales were made at concessions and that the formation of the combination is lingering.

The Copper market continues to be influenced by the variable reports with respect to the progress made by the syndicate in securing control of the productions of the various mining companies. It does not appear that the Tharsis Company has retreated from the position of refusing to come into the agreement, although a good many shares of the company have passed into French hands the past fortnight. The Cape Copper Company, according to current report, is also still holding aloof. Consumers are indifferent buyers, as are also outside speculators, pending further developments in the direction of a more far reaching combination.

**Scotch Pig.**—Business moderate and prices again a little lower on most brands.

No. 1 Coltness, f.o.b.	Glasgow.	51/6
No. 1 Summerlee, " "	" "	50/6
No. 1 Gartsherrie, " "	" "	47/6
No. 1 Langloan, " "	" "	49/6
No. 1 Carnbrue, " "	" "	43/6
No. 1 Shotts, " "	at Leith.	49/
No. 1 Glengarnock, " "	Adrossan.	47/6
No. 1 Dalmeillington, " "	" "	43/6
No. 1 Eglinton, " "	" "	43/
Steamer freights, Glasgow to New York,		
6/ @ 7/; Liverpool to New York, 7/6.		

**Cleveland Pig.**—The market steady at quotations, with demand fair. No. 1

Middlesboro', G. M. B., 34/6; No. 3 do.,  
32/, f.o.b.

**Bessemer Pig.**—Sellers are firmer, but there is little or no improvement in business. West Coast brands, mixed numbers, 45/, f.o.b.

**Spiegeleisen.**—Demand moderate and prices unchanged. English 20 % quoted at 74/, f.o.b.

**Steel Rails.**—The market steadier, but demand rather slow. Standard sections, £4, 2/6, f.o.b.

**Steel Blooms.**—Market steady, with demand better. We quote at 75/ @ 77/6, f.o.b., for 7 x 7.

**Steel Billets and Slabs.**—Prices very steady and the demand fair. Bessemer 2½ x 2½ inch Billets, £4. 5/, and Nail Slabs, £4. 2/6, f.o.b.

**Steel Wire Rods.**—The market firm and demand good. Mild Steel, No. 6, quoted at £5. 17/6 @ £6, f.o.b.

**Old Rails.**—Very moderate demand, and prices easier. Tees quoted at £2.15/ @ £2.17/6, and Double Heads £2.17/6 @ £3, c.i.f., New York.

**Scrap Iron.**—Moderate business and prices without change. Heavy Wrought at 50/ @ 52/6, f.o.b.

**Crop Ends.**—Fair sales at steady prices. Bessemer quoted £2.7/6, @ £2.12/6, f.o.b.

**Tin Plate.**—Demand has been slow and prices irregular with easier tone to-day. We quote, f.o.b, Liverpool:

IC Charcoal, Allaway grade .....	16/9 @	17/6
IC Bessemer steel, Coke finish. ....	14/9 @	15/3
IC Siemens " " " .....	15/3 @	15/6
IC Coke, B. V. grade .....	14/9 @	15/3
Charcoal, Terne, Dean grade .....	13/9 @	14/3

**Manufactured Iron.**—There continues to be a very good trade at steady prices. We quote, f.o.b. Liverpool :

	£	s.	d.	£	s.	d.
Staff. Ord. Marked Bars...	7	10	0	7	12	0
" Common "	5	00	0	5	5	0
" Blk sheet, singles	6	15	0	7	00	0
Welsh Ears (at Wales).....	4	12	6	4	15	0

**Tin.**—Consumers buying fairly. Market steady. Straits closed at £166. 10/, spot, and £144 @ £145, three months' futures.

**Copper.**—Market irregular and unsettled. Chili Bars closed at £74 @ £75; Best Selected, £78 @ £79.

**Lead.**—Dull market; prices barely steady. Soft Spanish, £14. 5/ @ £14. 10/.

**Spelter.**—Market steadier, but rather slow. Silesian, ordinary, £20. 5/ @ £20. 10/.

### Financial.

OFFICE OF THE IRON AGE,  
WEDNESDAY EVENING, January 26, 1888.

Trade is quiet in nearly all departments, both in speculation and actual merchandise. The usual dullness of midwinter is made more apparent by a series of blizzards of unprecedented severity, widespread in their influence. The miners' strike weighs heavily upon the iron interests and numerous industries dependent on the supplies of fuel. Financial measures in Congress likewise operate as a check to enterprise, so that business is being conducted on a conservative basis. Dry goods jobbers are almost alone in reporting considerable activity, and for manufactures of cotton the movement is very full, accompanied by the hardening of values generally. Collections, too, are spoken of as remarkably good, with all indications pointing to a large and healthy trade near at hand. In the grocery trade business is good for the season. A serious drawback is the heavy falling off in the export trade, while imports, largely made up of costly textile fabrics, continue in undiminished value. For grain the for-

eign demand is merely nominal, the outward movement even in Baltimore being extremely limited. Wheat is held in New York and Liverpool at about the same price, with California "deal" wheat pressing in direct competition with the Atlantic ports. Corn is about 1¢ per bushel lower. The coffee spot market is weakening. Cotton is slow of movement at about last week's prices.

The Stock Exchange markets have been irregular and generally lower, with little activity. On Thursday business was very light and confined to Reading and the other coal shares, with few exceptions. It was announced that the joint lease of Oregon Navigation lines by the Union and Northern Pacific companies had been finally consummated. On Friday a break in Missouri Pacific unsettled the market for most of the day. On Saturday prices rallied on the favorable bank statement. On Monday the entire market was weak excepting Manitoba and Pullman, although there were higher prices in London at the opening. Tuesday and to-day were extremely dull.

Governments were weakened by the announcement that Secretary Fairchild had suspended the privilege accorded to banks of receiving public deposits by pledging bonds. The 4½s declined to 107¾ @ 108¼, the registered 4s to 126 @ 126½, and the coupon 4s to 125¾ @ 126.

The clearings of 36 cities for week ended January 21, 1888, showed a decrease of 8.6 % compared with corresponding week last year. Outside of New York the clearings showed an increase of 3.7 % compared with last year. As compared with the previous week the decrease is \$55,737,808, and outside of New York \$11,481,510. Wichita reported a gain of 58.8 % San Francisco, 22.2; Chicago, 12.5, and Boston 0.1 %. Philadelphia fell off 5.9 and New York 14.8 %. Duluth's clearings amounted to \$1,278,384 this year, but in 1887 the city made no report.

The weekly bank statement reflects the heavy influx of currency from the interior, as well as the gain by the banks from the Treasury operations during the week. The specie and legal tender averages combined show an increase of \$5,577,200, but the gain in surplus reserve, owing to the increase in deposit liabilities, is somewhat smaller, being \$5,123,200. The light speculative demand for money led to a contraction in loans of \$1,406,000. The banks now hold \$20,914,475 in excess of legal requirements, against \$18,796,375 a year ago. In two weeks the surplus reserve of the banks has almost doubled, and accumulation at this center is likely to continue while trade slackens in activity. The increased ease of money in the open market at London has brought about a further reduction in the Bank of England rate of discount from  $3\frac{1}{2}$  to 3%. Outside of the bank discounts made a further decline to  $1\frac{1}{2}$ % and call money to  $1\frac{1}{4}$ %. We quote first-class paper, 60 @ 90 days,  $5\frac{1}{4}$ %; four months,  $5\frac{1}{2}$  @ 6%. According to the Custom House report the exports of specie from this port for the week were \$123,000, and since January 1 \$932,491, as compared with \$750,700 for the same time last year; and the imports of specie amounted to \$118,667, against \$315,481 for the corresponding time in 1887. In Boston the rates for money to borrowing banks is down to  $2\frac{1}{2}$ % for the first time since last February, and business paper is in demand at  $5\frac{1}{4}$ %. Chicago rates are about 7%. In Montreal commercial journals are quite unanimous in urging importers and merchants generally to exercise caution in the management of their business. The Canadian bank statement for December shows that five chartered banks are bankrupt. The Maritime Bank of New Brunswick, and the Central Bank of Canada are reported in liquidation. The Pictou Bank is winding



up business, and the Bank of London has suspended payment and is realizing on its assets. Secretary Fairchild has decided not to designate any more Government depositaries at this time. The amount of Treasury funds now on deposit in the national banks is more than \$50,000,000, or nearly three times the sum it was on March 4, 1885. The number of depositary banks has quadrupled during the same time.

Senator Farwell, of Illinois, has introduced in the Senate a bill for the refunding of the high-rate bonds held by the banks, for the use of the surplus in the purchase of bonds, and for the acceptance of State and municipal bonds under certain conditions as security for bank circulation. He proposes to exchange the bonds now held by the banks for 3 per cent. bonds, redeemable in 50 years, the banks to receive in cash the average premium current in the New York market for the previous 20 days. Mr. Bland has proposed a substitute for the Wilkins bill, now before the House, providing for the issue of coin certificates to the national banks upon the deposit of gold and silver bullion at their market value.

The imports of merchandise at this port during the week were valued at \$10,660,005, which is \$3,000,000 larger than for the corresponding week either in 1887 or 1886, and makes a total since January 1 of \$29,612,000, as compared with \$25,386,000 for the same time last year. The items comprise coffee, \$1,566,000; sugar, \$998,000; tin, \$559,000; india-rubber, \$441,000; hides, \$425,000. The exports of merchandise were \$6,960,582, a total since January 1 of \$18,591,224, as compared with \$17,730,600 for the same time in 1887 and \$23,825,910 in 1886. The items include 150,000 bushels of wheat, 22,118 bales of cotton, 6,451,000 gallons of petroleum and 5,800,000 lb cut meats.

The Bank of America elected Edmund W. Corlis president, to succeed W. L. Jenkins, who thus exchanges positions with the recent vice-president. The directors of the Fourth National Bank unanimously elected J. Edward Simmons president, in place of O. D. Baldwin, who recently resigned. The New York Coffee Exchange elected these officers: President, Geo. W. Crossman; vice-president, Joseph J. O'Donohue; treasurer, John F. Scott. The doors of the First National Bank of Auburn, N. Y., are closed, pending an examination of the books, which are expected to show a deficiency of \$200,000.

Henry H. Van Dyck, president of the American Safe Deposit and formerly superintendent of the State Banking Department, also Assistant United States Treasurer, died on Sunday, in Brooklyn, aged 70 years.

The new Mexican loan is said to have been placed in London at 84 % and will net about \$22,500,000.

The American Wire Nail Company, of Covington, Ky., telegraph us that there is no truth in the reports circulated in the Southern papers that they intend to move their plant to Anniston, Ala.

A movement is on foot in Western Texas and Southern New Mexico to secure Federal aid, if possible, in building an irrigating canal from 200 to 230 miles long for the purpose of reclaiming vast tracts of land that are now arid wastes. It is proposed to start the canal at a point on the Rio Grande and above the Jarnado Del Murato, in New Mexico, and carry it along the bottom lands of the Rio Grande Valley as far below El Paso as practicable. The Federal Government will be asked for a subsidy in the form of a grant of land, on the ground that such a canal would bring on the market large tracts of Government land that are now worthless.

## NEW YORK.

The principal feature of interest in connection with the Iron and Steel trades tributary to this market continues to be the developments in the Reading coal strike. Mr. Corbin's vigorous presentation of the questions at issue and the firm tone pervading that document indicate that so far as the employers are concerned the struggle will be continued. The men have answered in a somewhat feeble manner, and indications are cropping up pointing to a weakening on their part. There has been little that is new so far as the effect of the coal strike upon the Iron industries of Eastern Pennsylvania is concerned. A few additional furnaces have blown out, while others have secured enough coke to continue in operation. To what extent the use of coke will enable the furnaces running to produce a larger quantity of iron remains to be seen. It is certain, however, that even if this fact will prove an important one it will be inadequate to supply the gap created by the banking and blowing out of furnaces throughout the Schuylkill and Lehigh valleys. Consumers are beginning to complain that Lehigh Forge Iron has been deteriorating in quality as compared with its usual standard. It is certain that the relative percentages of production of Forge and Foundry grades has been thoroughly upset during the past few months, leading to a growing scarcity of the best grades, while Forge is probably made in relatively larger quantity. From reports coming from different quarters it appears that the falling off in the production is to some extent offset by a decline in the consumption of Pig Iron from the same causes. In Manufactured Irons the coke strike is having considerably less effect. Bituminous coal is plenty, and it does not require a heavy outlay to make the necessary changes for adapting furnaces for one or the other fuel.

Mr. James M. Swank's official figures for the Pig Iron production for the year 1887 are as follows:

	Gross tons.
Anthracite.....	2,087,847
Coke and Bituminous.....	3,813,067
Charcoal.....	516,234
Total.....	6,417,148
Deduct Increase of Stocks.....	75,815
Total.....	6,341,333
Add Imports, 11 months.....	443,162
December Imports (estimated).....	28,000
Apparent Home Consumption.....	6,812,495

The apparent home consumption is therefore over 6,800,000 gross tons. The total production of Bessemer Pig, according to Mr. Swank, was 2,859,065 gross tons. Adding to this about 400,000 tons imported. Bessemer Pig, Spiegeleisen and Ferromanganese, these would indicate a Steel works consumption in 1887 of about 3,250,000 gross tons, not taking into account any possible increase in stocks. According to fuel the stocks were as follows, in gross tons:

	Dec. 31, 1886.	Dec. 31, 1887.
Bituminous.....	63,066	114,266
Anthracite.....	45,092	101,881
Charcoal.....	117,470	85,296
Total.....	227,628	301,143

This stock represents less than three weeks' make of Anthracite Pig, less than two weeks' product of Coke Pig, and about two months' output of Charcoal Iron, at the rate of production of 1887.

**American Pig.**—The market has been very steady, with little doing and no movement so far as the placing of contracts for the future is concerned. There is apparently no pressure whatever to sell even of Forge grades, which were weak during December. Some of the Lehigh furnaces have notified their agents to hold out for an advance of 50¢ a ton, and

similar instructions have come to representatives of Southern furnace companies. From Alabama and Tennessee reports indicate the blowing out for repairs of three or four furnaces, and it appears that practically little Iron from that quarter is for sale by the older furnaces for the next four or five months.

**Scotch Pig.**—The market is quiet at \$22 @ \$22.50 for Coltness; \$21 @ \$21.50 for Dalmellington; \$21 @ \$21.50 for Glegarnock; \$21.50 @ \$22 for Summerlee; \$20.50 @ \$21 for Clyde, and \$19.50 @ \$20 for Eglinton.

**Spiegeleisen.**—We note a small sale at \$27.50 for 20 %.

**Bessemer Pig.**—We hear of no transactions either in domestic or in foreign, but the weakness in the West, caused by the selling of one large producer, has had the effect of diverting furnaces running on Bessemer Pig in the Shenango Valley in this direction. Efforts are now being made to study the situation with the view to finding the outlet in Eastern Pennsylvania, but there appears to be little prospect of success in such efforts.

**Structural Iron.**—For the season there is a fair amount of architectural work, and considerable new business is coming up. Bridge Plates are 2.15¢ @ 2.20¢, delivered; Angles, 2.30¢ @ 2.40¢; Tees, 2.75¢ @ 2.80¢, and Beams and Channels, 2.3¢ base, on dock.

**Bar Iron.**—Representatives of Western mills report the placing during the past few weeks of considerable quantities of Bar Iron at points east of the Allegheny Mountains. We quote for carload lots on dock, with half extras: Common, 1.80¢ @ 1.85¢; Medium, 1.85¢ @ 1.95¢; Refined, 1.95¢ @ 2¢, with occasional concessions under special circumstances.

**Steel Rails.**—There has been considerable inquiry, and quite a large number of negotiations are now pending, both East and West. The market, however, remains somewhat feverish, with quotations \$31.50 @ \$32 at Eastern mills. We note a sale by a mill in Western Pennsylvania of 5000 tons for the Northwest, and a lot of 5000 by an Eastern Pennsylvania mill to the South at private terms. Among the negotiations said to be pending is a lot of 9000 tons for West Virginia.

**Wire Rods.**—The market is dull, with importers asking nominally \$41 @ 41.50 but doing no business. We note that the Joliet Steel Company have just begun the building of a Garrett Rod mill.

**Old Rails.**—There have been sales of Double Heads from store aggregating about 1000 tons at \$23. There are orders in the market for a round block of Tees for an Eastern manufacturer, and Pittsburgh and Mahoning Valley mills are also negotiating for tidewater stock. We quote Tees \$22 and Double Heads \$23.

**Railroad Supplies.**—There is more activity in Spikes, which we quote at \$2.20 @ \$2.25. The meeting of the association has been postponed to the 10th of next month.

## Philadelphia.

Office of The Iron Age, 220 South Fourth St., PHILADELPHIA, PA., January 24, 1888.

**Pig Iron.**—The past week has not brought with it any change of feature, and things are practically in the same condition as noted in our last report. Several additional furnaces have been banked, and others probably will be in a short time, but there is no real scarcity of Iron, although certain desirable brands are hard to get, and to that extent consumers suffer some little inconvenience. But consumption is very light compared to what it was a couple of months ago, particularly in the foundries, although there should be and

probably will be a revival of activity in course of a few weeks; meanwhile the aggregate supply of Iron is ample for all requirements. The difficulty is not so much in getting Iron as in getting the right kind of Iron. The impression gains ground, however, that in no case can prices advance, while there is a possibility (if not a probability) that lower quotations may be seen as soon as the coal strike is at an end. At present there is no disposition to force matters, either by buyers or sellers, and so far as we can see this state of affairs will continue for some time unless new developments take place in regard to the strike, which do not appear to be very likely. Prices are of course very irregular, owing to the scarcity of desirable brands, and to the numerous offerings of outside lots. Standard brands command from \$21 to \$21.50 at tide for No. 1 Foundry, \$19 for No. 2, and \$17 to \$17.50 for Gray Forge. Others of nominally the same grade may be had at very much less money, but it is hardly worth while to name prices without specifying the quality of each brand, which is obviously impossible. As to the outlook very little can be said at present, except that while the volume of business is likely to be large prices may be very irregular, and perhaps not very satisfactory to producers.

**Foreign Iron.**—No business of any amount to report. A few thousand tons of a special brand of Bessemer has been taken, but on terms not made public. The foreign market is somewhat easier, and ordinary brands of Bessemer are offered at about \$20, c.i.f., duty paid, and 20¢ Spiegel at \$28 @ \$28.50 same terms.

**Blooms.**—Nothing doing in foreign, although quotations are gradually easing off a little, but are still too high to compete with the home make. Quotations remain at about \$31 @ \$32 for Nail Slabs; \$31.50 @ \$32.50 for 4 x 4 Billets; \$36 @ \$38 for Siemens-Martin. Domestic Blooms as follows: Steel, from \$30 to \$35, f.o.b. cars at mill, according to analysis; Charcoal Blooms, \$53 @ \$54; Run-out Anthracite, \$45 @ \$46; Scrap Blooms, \$38 @ \$39 3/4 "bloom" ton.

**Muck Bars.**—There is very little change to note in this department. Sales are made on the basis of \$30 @ \$30.50 at mill, according to quality, delivery, &c. Supply and demand about in proportion, so that prices are steady and unchanged.

**Bar Iron.**—The demand is moderately large, some very nice orders having been distributed during the past 10 days. The reduction in labor will help manufacturers a little, but it is difficult to secure business at 2¢, so that with the stiffening in the price of Pig Metal and fuel, or—what amounts to the same thing—the substitution of inferior qualities, it is no easy matter to figure out a fair living profit. The conditions are somewhat exceptional, however, although it seems likely that the margin will have to come from lower cost rather than from better prices. Consumption is large, and a great deal of work is being contracted for, which will undoubtedly cause a steady demand for Bars, but competition is so sharp, not only from mills all through the State, and the low price of Steel is making a steady inroad into the Bar trade. The Skelp trade was very helpful a year ago, and it is thought will be so later on this season, but it has been a good deal of disappointment so far. Some of the mills are pretty well employed on this class of Iron, while others are very anxious to secure a few hundred tons as a "back-log." Sales of Bars have been on the basis of 1.9¢ @ 2¢, and Skelp at 1.9¢ @ 1.95¢ for Grooved and 2.1¢ @ 2.2¢ for Sheared.

**Plate and Tank Iron.**—There is not much doing in Plates, although some of the mills manage to run full, while others are doing little or nothing. Consumption is

large and promises to continue so, but the facilities for meeting the demand are so great that there is a constant scramble for business. Then there is the ever increasing supply of low-priced Steel, so that between them all only the best managed and best equipped mills seem to have any kind of a chance for business. All this may be changed for the better in course of a few weeks' time, but at the moment there is nothing specially encouraging in the outlook. Prices are fairly steady and are usually quoted about as follows: Ordinary plate, 2.15¢ @ 2.20¢; Tank, 2.20¢ @ 2.25¢; Shell, 2.6¢ @ 2.7¢; Flange, 3.5¢; Fire-Box, 4¢; Steel Plates, Tank and Ship Plate, 2.4¢ @ 2.5¢; Shell, 2.8¢; Flange, 3¢ @ 3 1/4¢; Fire-Box, 3 1/4¢ @ 4 1/4¢.

**Structural Iron.**—Nothing of any importance has been done during the past few weeks, but the mills have plenty of orders on their books, and are kept fully employed in that way. There is nothing extensive under negotiation at present so far as we can learn, although there is plenty of business in prospect, providing nothing unforeseen occurs; but in the present unsettled condition of affairs it is only natural that parties are disposed to wait developments. Prices are about as follows: 2.25¢ @ 2.35¢ for Bridge Plate; 2.3¢ @ 2.35¢ for Angles; 2.8¢ @ 2.9¢ for Tees and 3.3¢ for Beams and Channels, Iron or Steel.

**Sheet Iron.**—A very good demand is reported for Light Sheets, and as yet stocks have not accumulated at all. There is also some disposition to buy for forward delivery, but makers are rather conservative on that point. Prices about as follows for small lots, best makes:

Best Refined, Nos. 26, 27 and 28.....	3 1/4¢
Best Refined, Nos. 18 to 25.....	3 1/4¢
Common, 1/4¢ less than the above.....	
Best Bloom Sheets, Nos. 26 to 28.....	4 1/4¢ @ 4 3/4¢
Best Bloom Sheets, Nos. 22 to 25.....	4 @ 4 1/4¢
Best Bloom Sheets, Nos. 16 to 21.....	3 1/4¢ @ 3 3/4¢
Blue Annealed.....	2 1/2 @ 3 ¢
Best Bloom, Galvanized, discount.....	60 ¢
Common, discount.....	65 ¢

**Steel Rails.**—The market is very quiet, only small transactions being made at quoted rates. Manufacturers are expecting daily to hear from some of the leading roads, but they give no indication yet of what they will require or when they will require Rails. Of course every week makes it more difficult for them to hold out, and in the meanwhile mills are going on with such work as they can get at about \$32 @ \$33 at mill, according to quantity, delivery, &c.

**Railway Supplies.**—There is not much demand at present, but prices are steady at 2¢ @ 2.1¢ for Fish Plates, and 3 @ 3.15¢ for Track Bolts.

**Old Rails.**—Interest in this department seems to have subsided, neither buyer nor seller showing any disposition to recede from their position. The offerings are light, and although inquiries have been numerous sales have been quite small. American Tees are wanted at about \$23, Philadelphia, or foreign at \$21.50 @ \$22, with sellers at about \$1 more money.

**Scrap Iron.**—The demand keeps up very satisfactorily, and good qualities with favorable deliveries bring outside quotations, which are about as follows: No. 1 Scrap, \$21 @ \$21.50; carload lots, \$22 @ \$22.50, or for choice lots \$22.50 @ \$23. No. 2 do., \$14 @ \$15; Turnings, \$15 @ \$16; Old Car-Wheels, \$17.50 @ \$18; Old Steel Rails, \$20 @ \$21; Cast Scrap, \$16 @ \$17; do. Borings, \$11 @ \$12; Old Fish Plates, \$26 @ \$27. Sale of Old Car Wheels at \$19, delivered.

**Wrought-Iron Pipe.**—Prospects seem to be good as regards the volume of business, but prices are very unsatisfactory. The usual discounts are about as follows: Butt-Welded, Black, 4 1/4¢; Butt-Welded Galvanized, 3 1/4¢; Lap-Welded Black, 60¢; Lap-Welded Galvanized, 3 1/4¢; Boiler Tubes, 5 1/2¢.

**Nails.**—Prices are steady at about \$2.10, although the demand is quite small, as may be expected at this season. Manufacturers seem determined to close their mills rather than continue supplying Nails, as they have been doing, at less than actual cost.

[By Telegraph.]

PHILADELPHIA, PA., January 25, 1888.

The Pennsylvania Railway Company have bought 30,000 tons of Steel Rails to-day at over \$31 at mill, and will want as many more. Twenty thousand tons were taken by Burlington and Quincy a few days ago. Sales during the past week are not far from 80,000 tons. The general market is firm and decidedly active, the scarcity of good Iron being very noticeable to-day.

## Chicago.

Office of The Iron Age, 95 and 97 Washington St.,  
CHICAGO, January 23, 1888.

**Pig Iron.**—Generally speaking, this market has been quiet during the past week, although some of the furnace companies situated so as to handle the business have been able to place large orders for Lake Superior Charcoal Iron among the Indiana Car-Wheel manufacturers. The car builders of that State have also bought quite liberally of Ohio and Southern Coke Iron. Negotiations are pending from the same class of consumers for further lots of Charcoal Iron. A fair trade has been enjoyed here in carload orders for all kinds of Iron, but the purchase of large quantities has been deferred by local consumers, who are influenced to some extent by the bearish reports from Pittsburgh published in the daily papers. It will take some time to overcome the effect of these statements, as buyers now believe that Coke Irons must come down in price, despite the efforts of sellers to convince them that with the present cost of raw materials and the ruling rates of freights lower prices should not be expected. The supply of Southern Coke Iron has again become a little better, the explanation being made that some orders taken elsewhere have been countermanded, so that this market has been resorted to rather unexpectedly, although full prices are asked by the sellers. Cash quotations continue as follows, f.o.b. Chicago: Lake Superior Charcoal, Nos. 1, 2 and 3, \$22; Alabama Car-Wheel, \$26; Southern Charcoal Foundry, \$21.50 @ \$22.50; Jackson County Softeners, No. 1, \$21; Hocking Valley Soft Foundry, No. 1, \$20.50; Hocking Valley, guaranteed Silicon, No. 1, \$20.50; American Scotch, No. 1, \$20.50 @ \$21.50; Lake Superior Coke, all Ore, No. 1, \$20 @ \$21; No. 2, \$19 @ \$20; Cinder Mixed, 50¢ less; Coke Bessemer, run of furnace, \$20 @ \$21; Southern Coke, No. 2, \$19.50 @ \$19.75; No. 2 1/2, \$19.

**Bar Iron.**—Large orders for Iron for Carwork have been placed, the quantities ranging from 1000 to 3000 tons, at a little under 1.75¢, flat. Orders from other classes of consumers have also been excellent. The mills are now pretty well supplied with work, and agents have a good foundation on which to base their efforts to get better prices, especially as other large orders are in sight and the outlook is thus made very encouraging. Quotations on mill orders for Common Iron continue at 1.75¢ @ 1.80¢, f.o.b. Chicago, according to quantity, with 1.90¢ @ 2¢ asked for guaranteed Muck Bar Iron. Store prices still range from 2¢ @ 2.2¢, according to quantity and quality.

**Structural Iron.**—A light business is reported. The prospect for bridge work is not nearly so bright as it was a year ago. Prices on mill orders, f.o.b. Chicago, are



as follows: Angles, 2.35¢ @ 2.40¢; Tees, 2.75¢; Universal Plates, 2.50¢ @ 2.60¢; Beams and Channels, 3.4¢. Store prices are  $\frac{1}{10}$ ¢ @  $\frac{1}{2}$ ¢ higher than these rates.

**Plates.**—A good demand from store is reported, but country trade is quiet. Store quotations are as follows: Heavy Sheets, Nos. 10 to 14, 2.80¢; Tank Iron, 2.75¢; Tank Steel, 3¢; Shell Iron, 3.25¢; Shell Steel 3.50¢; Flange, 4¢; Fire-box, 4.75¢. Boiler Tubes are weak, and while the combination price continues to be  $5\frac{1}{2}$ ¢ off they are sold at 55¢ and even better, according to the specification.

**Sheet Iron.**—Mill orders are quoted on basis of 3.10¢ f.o.b., Chicago, for No. 27 Common Black, but there is very little doing, and this price could be shaded on actual business. Jobbers continue to quote 3.50¢ for No. 27, with usual allowances for quantity.

**Galvanized Iron.**—No change has occurred in this branch of trade, manufacturers' agents and jobbers having the usual volume of business at this season. Jobbers quote 60% off on Juniata and 60% and 5% off on Charcoal.

**Merchant Steel.**—The past week has been very quiet. Quotations are as follows: Bessemer Bars, 2.35¢ @ 2.50¢; Tool Steel,  $8\frac{1}{2}$ ¢ @  $9\frac{1}{2}$ ¢; Specials, 13¢ @ 25¢; Crucible Spring, 4.25¢; Open-Hearth Spring, 3.30¢; Open-Hearth Machinery, 2.75¢ @ 3¢; Crucible Sheet Steel, 7¢ @ 11¢.

**Steel Rails.**—A number of orders are in the market, aggregating a very respectable tonnage, some of which it had been expected would be placed before this time. They have not developed into actual business yet, but it is believed that these purchases will not be deferred much longer. The manufacturers continue to quote \$35 for standard sections.

**Old Rails and Wheels.**—In Old Iron Rails no movement has transpired, \$21 being the nominal quotation. A few hundred tons of Old Car-Wheels have changed hands at about \$21.

**Scrap.**—Very little business has been done in this line. Dealers offer \$13 @ \$14 for Mixed Country. Quotations for carefully selected are as follows,  $\frac{1}{2}$  ton of 2000 lb: Railroad Shop or No. 1 Forge, \$21; Track, \$19; Mill Iron or No. 1 Wrought, \$16; Light Wrought, \$9.50 @ \$10.50; Machinery Cast, \$16; Stove Plate, \$11.50 @ \$12.50; Cast Borings, \$10 @ \$10.25; Wrought Turnings, \$12.75; Axle Turnings, \$14.50; Coil Steel, \$15; Leaf Steel, \$16; Locomotive Tires, \$16.50 @ \$17; Mixed Steel Scrap, \$12; Horseshoes, \$19.50 @ \$20; Axles, \$26.

**Barb Wire.**—A great deal of inquiry is reported from large buyers, but the small trade has not yet come into the market. The action of the manufacturers, in advancing their prices  $\frac{1}{2}$ ¢ @ 1¢ lb at the meeting here on Thursday last is expected to have a stimulating effect on business, especially as the jobbers immediately followed suit and raised their quotations to 3.35¢ for Painted in carload lots and 3.40¢, @ 3.45¢ for less than carloads, with the usual advance of  $\frac{3}{4}$ ¢ for Galvanized.

**Nails.**—A good demand is still reported from the heavy buyers, with factory prices unchanged. Jobbers are having a good trade in carload lots. They now name \$2.10 as their bottom price for carloads of Steel Cut Nails and \$2.20 for smaller quantities. Iron Nails are quoted at 10¢ less than Steel, but the call for them is comparatively limited. Wire Nails are quoted by jobbers at \$2.90 in small lots, with 10¢ off in carloads. The demand for these Nails is now moving along very steadily on a basis of about one-fourth of the total sales of Nails by jobbers.

**General Hardware.**—In Shelf Hardware trade is looking up, an active demand being experienced in some lines of goods.

The outlook is very good, and prices are firm. The principal inquiry is for Nails, Barb Wire, Agricultural Implements, Wire Cloth and such articles generally as are needed for the spring trade. In Heavy Hardware, Wagon Supplies, &c., business is quiet as yet, but jobbers are looking for an early revival of activity. An advance has been made in the price of Nuts in accordance with the action of manufacturers, and sellers are now naming rates only on application.

**Pig Lead.**—Offerings have been limited during the week. Some Soft Missouri and Wisconsin was sold down to \$4.50 to the local trade and 200 tons Argentiferous were placed at \$4.70 for late January delivery. The position of the metal is characterized as strong by local dealers.

The Charcoal furnace of the National Furnace Company, at Depere, Wis., met with an accident last week, compelling it to be blown out. It was not a boiler explosion, but the end was merely blown out of the air receiver, doing no serious damage, but annoying the owners at the time lost at this season. It will be in operation again by the first week in February. Messrs. Pickands, Brown & Co., of Chicago, agents for this furnace, state that in the meantime they are able to fill all orders from stock on hand.

John E. Cartwright, 58 Dearborn street, Chicago, is now representing in this market the well-known Pig-Iron firm of Chamberlain, Wheeler & Co., of Columbus, Ohio. The brands sold through this house are the Akron, Gore, Bessie, Winona and Baird, of Hocking Valley; the Graffton, of the Mahoning Valley, and the Jefferson, making Hanging Rock Cold Blast Charcoal Iron.

Nelson B. Williams, Western agent for the Hartman Steel Company, manufacturers of Wire Nails, Wire, &c., has made an arrangement with the East Chicago Steel Works, of Hammond, Ind., for the sale of their Steel Cut Nails, and is now ready to fill orders for both kinds of Nails. Mr. Williams's office is at 107 Dearborn street, Chicago, and he has a large warehouse at Newberry avenue and Sixteenth street, where a full stock of goods will be carried to meet demands for immediate shipment and assorted carloads.

## Pittsburgh.

Office of The Iron Age, 77 Fourth avenue, Pittsburgh, Pa., January 24, 1888.

The general Iron trade continues in much the same condition. While in some respects the outlook is unfavorable, in others it is favorable. The labor complications are the most unfavorable features connected with the trade at present, as they have a tendency to unsettle everything else. Owing to the recent sharp depreciation in the value of Pig Iron furnacemen are making an effort to reduce the cost of production so as to enable them to meet the market. They have asked for a reduction of 10% in wages, which the men are not disposed to grant. It is evident that unless cost of production is reduced a number of the furnaces will have to blow out or bank up, as some have done already. We hear of an order having been taken the past week by a certain concern at a price at which it was refused by the Carnegies, so it is evident that the latter firm are not responsible for all the cutting that has been indulged in so freely of late.

**Pig Iron.**—The market continues in an unsettled and unsatisfactory condition, but it is hoped that a better state of affairs is near at hand. Consumers continue to buy only as their immediate actual wants require, while producers generally are indifferent about making additional sales at present prices. One of our city furnaces has been refusing to sell for some weeks

past, claiming that there was no margin for profit at the prices. While standard brands of Mill Irons have undergone no change in price during the past week, Foundry grades went off somewhat, and Bessemer Pig dropped from 75¢ to \$1  $\frac{1}{2}$  ton. Sales of Bessemer were made as low as \$17.75, cash, to \$18, four months, the latter for delivery at furnace of seller. Best brands of Neutral Gray Forge are still quoted as \$16.25 @ \$16.50, cash, and, so far as we are advised, there have been no sales of desirable brands below the prices quoted. Consumers, while freely admitting that prices are low, continue to buy very sparingly, desiring to keep themselves in a position so that if the market should happen to go still lower they will be in position to take advantage of the same. Consumers generally, are low in stock, and once there is evidence of a reaction they will nearly all want to buy; but as long as the market remains in its present condition there is not likely to be any improvement in demand. We quote prices as follows:

Neutral Gray Forge.....	\$16.50 @ \$17.00 4 mos.
White and Mottled.....	15.50 @ 16.00 "
All Ore Mill.....	17.50 @ 18.00 "
No. 1 Foundry.....	19.00 @ 19.50 "
No. 2 Foundry.....	18.00 @ 18.50 "
No. 1 All-Ore Foundry.....	19.50 @ 20.00 "
Charcoal Foundry.....	24.00 @ 25.00 "
Cold Blast Charcoal.....	27.00 @ 30.00 "
Bessemer Iron.....	18.00 @ 18.50 "

**Muck Bar.**—Is dull and lower. We now quote at \$28.50 @ \$29, cash, for good strong Neutral. It is intimated that it has been offered as low as \$28, cash, but if so it has probably been some off lot.

**Manufactured Iron.**—Orders continue to come forward slowly, but an improved demand is looked for as the season becomes more advanced. Prices continue easy; in sympathy with the raw material. Bars are quoted at 1.80¢ @ 1.90¢; Plate, 2.35¢ @ 2.40¢; No. 24 Sheet, 2.80¢ @ 2.90¢. Some orders for Pipe Iron have been placed recently, but the demand is likely to continue light until the spring season opens up.

**Nails.**—There is nothing new to note in regard to the Nail trade; business continues light, but it is hoped that there will be an improvement before long, although the outlook is not as encouraging as it might be. However, as stocks, both in the hands of jobbers and consumers, are very much depleted, there is likely to be some improvement in demand before long, although manufacturers, both here and at Wheeling, are very much discouraged. Prices remain unchanged. We continue to quote at \$2.60 days, 2% off for cash, with the usual rebate of 10¢  $\frac{1}{2}$  keg on carload lots and upward.

**Wrought-Iron Pipe.**—There is but little new business offering, nor is it to be expected at this season of the year. The meeting of the Pipe Association announced to take place in Philadelphia last Thursday was adjourned over for some reason or other. Probably there was nothing to come before the meeting. Prices remain as last quoted. Discounts on Black Butt-Welded, 50%; on Galvanized do., 42 $\frac{1}{2}$ %; on Black Lap-Welded, 62 $\frac{1}{2}$ %; on Galvanized do., 50%; Boiler Tubes, 57 $\frac{1}{2}$ % off; Casing, all sizes, 52 $\frac{1}{2}$ % off; 2-inch Tubing, 13¢ per foot net; 2-inch Line Pipe, 12¢.

**Old Rails.**—The market is more active and firmer; we can report a sale of 1000 tons American Tees at \$24.25, cash. A party having a lot of foreign Tees stored here reports having been offered \$24.50 for the same, which he refused. Holders appear to have a good deal of faith in the near future of the market, which is based largely upon the fact that foreign cannot be laid down in this country at present prices, and the arrivals from the other side are light in consequence. The stock of American is light, and growing less and less every year.

**Billets, &c.**—There have been some small sales of Bessemer Steel Billets for immediate delivery at \$29.50 @ \$30, cash, but some lots for future delivery are still to be had at \$29, cash. Foreign Billets could not be laid down in Pittsburgh, so it is stated, under \$32.50 @ \$33, and, as a consequence, they are pretty effectually shut out of the market. There have been no sales of Nail Slabs or Rail or Bloom Ends reported for a couple of weeks, and it is difficult in the absence thereof to give reliable quotations.

**Steel Rails.**—There appears to be little or nothing in this market. Buyers are still holding off in expectation of lower prices. We continue to quote heavy sections for near-by delivery at \$32.50 @ \$33, free on cars in Pittsburgh.

**Railway Track Supplies.**—There is not much inquiry at present, but an increased demand is looked for before long. Prices remain unchanged. Spikes, 2.60¢, 30 days, delivered; Splice-Bars, 1.90¢ @ 2¢; Track Bolts, 3¢ with square and 3.10¢ with hexagon nuts. An increased trade is looked for next month.

**Old Material.**—There is a moderate business with but little change recently in prices. No. 1 Wrought, \$20 net ton; Wrought Turnings, \$14 @ \$14.50; Car Axles, \$26 @ \$27; Cast Borings, \$12 @ \$13, gross; Cast Scrap, \$16.50 @ \$17. No demand for Car-Wheels in this market, and in the absence of sales we omit quotations. Sale 500 tons Open-hearth Scrap Steel reported on private terms.

## Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts.,  
CINCINNATI, JANUARY 23, 1888.

**Pig Iron.**—There has been increased activity in the local market for Pig Iron during the past week, and to this extent the market has improved, but there has been no advance in prices—at least no change for the better, which is apparent in the transactions reported, and yet no ground has been lost by the furnaces. That buyers have been willing and have placed large orders for a number of months ahead is evidence that they are satisfied with the prices prevailing, and, on the other hand, the fact that furnaces have accepted and even solicited orders on the present basis would lead to the same conclusion. It is not to be supposed that a company would sell its capacity twice for the same time, and yet competition is active if not acrimonious, and some producers in favored localities are enabled to live and flourish at prices at which other plants must either lose or close. It is reported that a number of furnaces in the East have already blown out, and there are rumors that a number of producers, not far from Pittsburgh, will be compelled to bank up or blow out if there is not an advance in the price of Iron, a decline in the price of Coke or more favorable transportation rates. However this may be, the fact is that railroads consider this an opportune time to buy; Stove manufacturers and Pipe makers have given evidence of confidence in the large purchases made. Cincinnati representatives have taken orders for at least 20,000 tons during the week, and probably more has been sold, when the number of small sales have been added to the list. Sales have been made of prompt shipment, two to five months and also for delivery during the entire year.

Among the sales are 3500 tons Southern Car-Wheel, at \$23.85, on four months time; 4000 tons No. 2 Mill, a little less than \$16, on cash basis; 5000 tons No. 1 Mill at \$17, and 4000 No. 2 Foundry at \$18.25 @ 18.50, with smaller amounts at \$18, and rumors of one lot of 1000 tons at this rate; 2000 tons Ohio No. 2 Mill at \$15.75, cash. The prices current here at the close,

on cash basis, f.o.b. cars Cincinnati, are as follows:

Hot-Blast Foundry.	
Ohio Southern Coke, No. 1.....	\$20.00 @ \$20.50
Ohio Southern Coke, No. 2.....	18.50 @ 19.00
Ohio Southern Coke, No. 3.....	18.00 @ 18.50
Ohio Soft Stone Coal, No. 1.....	20.00 @ 20.50
Ohio Soft Stone Coal, No. 2.....	18.50 @ 19.50
Mahoning Valley.....	20.50 @ 21.00
Hanging Rock, Charcoal, No. 1.....	22.00 @ 24.00
Hanging Rock Charcoal, No. 2.....	22.00 @ 23.00
Tennessee and Alabama, No. 1.....	21.00 @ 21.50
Tennessee and Alabama, No. 2.....	19.50 @ 20.50
Forge.	
Strong Neutral Coke.....	17.00 @ 17.50
Mottled Neutral Coke.....	15.50 @ 16.00
Cold Short.....	16.00 @ 17.00
Car-Wheel and Malleable Irons.	
Southern Car-Wheel.....	23.00 @ 24.00
Hanging Rock, Cold Blast.....	24.00 @ 25.00
Lake Superior Car-Wheel Malleable.....	22.50 @ 23.00

**Manufactured Iron.**—The market is somewhat unsettled and easier. Although local mills as a rule have been enabled to secure full orders without cutting much in price, yet a number of large buyers in this vicinity have obtained supplies from competitive points at lower prices than local mills have been willing to accept.

**Nails.**—There has been a slow and an easy market with the bulk of trading at the inside rates: 10d @ 60d sell at \$2 @ \$2.10 ¢ keg, and other sizes at proportionate rates. Steel Nails sell at \$2.10 @ \$2.20 and Steel Wire Nails \$3 @ \$3.10 ¢ keg.

**Old Rails and Wheels.**—There has been no improvement in the market for Old Rails. It is difficult to attract buyers over \$21 @ \$21.50 ¢ ton, and yet there is no pressure to sell at these rates. Old Wheels, however, have met a fair demand at \$20 @ 20.50 ¢ ton, with moderate sales at these rates.

## Chattanooga.

Office of *The Iron Age*, Carter and Ninth Sts.,  
CHATTANOOGA, TENN., JANUARY 23, 1888.

There appears to be no perceptible change in the amount of general business that is being transacted throughout the South. The hardware merchants are having a full volume of trade in their respective lines; the manufacturers, of sash, doors and blinds are equally successful in getting their full share of business. There appears, however, to be a hesitation among most of our wholesale dealers on extending the usual credits that purchasers have heretofore enjoyed; especially is this so to those known to have been under the influence of the booming land fever that has more or less prevailed in many sections of the South during the past year. So far as expressions can be obtained from the different merchants, they are decided in their opinion that the trade will be somewhat larger the present year than during the year that has just passed.

**Pig Iron.**—There is little change to note in this article beyond a gradual stiffening up in feeling among the producers, who appear to be of the opinion that the troubles East will soon cause prices to advance considerably more than they are at present, although we cannot fail to note an advance already of 50¢ @ \$1 ¢ ton on good and favorite brands. An insight into the books of some of our larger producers reveals the fact that those furnaces who have pursued a conservative course during the past year—that have avoided making sales of large round lots—that have held their products ready for immediate delivery—have averaged from 50¢ to \$1 ¢ ton more than the furnaces that have disposed of their output in lots of 5000 and 10,000 tons at a time; in fact, selling their entire output for future delivery for some months ahead. Many such are very much behind their sales, and have no Iron to spare to any new customer, no matter what their necessities are nor what he is willing to pay, while those who have held back are ready to deliver at one day's notice, and still none of

them have carried stock of amount in their yards. The demand just now is quite pressing from the East, and some of the furnaces that have had Iron to spare in the future have made some contracts. Rates to some of the Missouri and Mississippi river points have been reduced from 40¢ to about \$1 per ton, which will be the means of letting into those sections more of the products of our Southern furnaces than heretofore.

**Miscellaneous.**—The mania for the building of new furnaces is not as great as it was last year; still there are some three or four concerns that are moving in that direction and with parties that are abundantly able to carry out what they undertake; the idea seems to prevail among many who desire to become interested in the Pig Iron business that no matter what action Congress may take that is in the way of reducing the tariff on Pig Iron, it still can be made at a profit in the South, and there are not those wanting who freely express not only a willingness, but a desire that at least \$2 @ \$3 ¢ ton should be taken off from the present tariff.

## Louisville.

LOUISVILLE, KY., JANUARY 23, 1888.

**Pig Iron.**—There has been no especial change in the market. Holders of Iron appear to be a shade stiffer, but buyers are not willing to pay more than Iron was bought for last week. What offerings have been made in the city during the last few days have consequently not been accepted save for immediate use. From cities beyond Louisville that are tributary to this market there seems to be a quiet buying movement, especially among car companies, who are crowded with work. Old Wheels sold here on basis of \$17.75, cash, and Old Rails at about \$22. All buyers seem to be watching the movement of Congress, and are afraid to buy in very large quantities save where decided bargains are offered, as they are afraid some action may be taken in regard to the tariff that will demoralize the Iron market and cause prices to make a still further decline. Current quotations:

Southern Coke, No. 1 Foundry...	\$19.00 @ \$20.50
" No. 2 ".....	18.00 @ 19.50
" No. 3 ".....	17.00 @ 19.00
Hanging Rock, Coke, No. 1 Foundry.....	19.50 @ 20.50
Hanging Rock, Charcoal, No. 1 Foundry.....	22.50 @ 24.00
Southern Charcoal, No. 1 Foundry.....	19.50 @ 21.50
Silver Gray different grades.....	16.00 @ 18.00
Southern Coke, No. 1 Mill, Neutral.....	16.50 @ 17.50
" No. 2 ".....	15.75 @ 16.75
" No. 1 "Cold Short.....	15.75 @ 16.75
White and Mottled, different grades.....	15.00 @ 16.00
Southern Car-Wheel, standard brands.....	24.00 @ 25.00
Southern Car-Wheel other brands.....	22.00 @ 23.00
Hanging Rock, Cold Blast.....	24.00 @ 25.00
Hanging Rock, Warm Blast.....	20.00 @ 21.00

W. B. BELKNAP & Co., Louisville, report as follows, under date of January 23, 1888: Business for the week has been fair in volume; the extreme cold and succession of modified blizzards that we have shared in common with the rest of the country has done more or less to check business, particularly north of us. But the middle of winter once past it is readily recognized that this sort of thing cannot last, and buyers are anticipating their wants with confidence and freedom.

**Bar Iron.**—Is comparatively slow, but there is no hesitation on the part of buyers at the price. Prices are low and seem destined to remain so, but a recuperation of a few points from present figures is not improbable.

**Nails.**—Owing to the cessation of building operations Nails are somewhat apathetic. The action of the Wheeling mills in reducing the card and closing works looks very much like a set up game to readjust cost in the shape of labor, raw material, &c.



**Wire.**—There is no change to speak of, but a very fair demand from the Southern points.

Many goods are notably scarce, Trace Chains among them. It is difficult, too, to get a large assorted order of Carriage Bolts or Axles filled with promptness, both of which go to indicate that factories are well employed. Many prices are still extremely low, and have not shared the advances of the past year at all. This is the result of extreme over production.

## St. Louis.

St. Louis, January 23, 1888.

**Pig Iron.**—A rather singular and irregular contest has been going on the past week over some good-sized orders that were in the market to be placed. A number of buyers claim to have been offered a Southern Coke No. 2 Foundry at \$18.25, cash, and sales were reported on this basis. Investigation, however, shows that no such orders were placed, and the furnace company in question deny having offered any No. 2 Foundry at any price. The alleged quotations, however, have been used vigorously on the leading companies, who are holding No. 2 Foundry firm at \$19, cash, St. Louis. The orders referred to are not yet placed, and the situation is a sort of stand-off. There is unquestionably a stronger disposition to buy, and with some large consumers a necessity exists to place orders soon. The furnaces are firmer than a week ago, many of them having booked large orders from other markets. The next week or two is likely to develop considerable business. We quote for cash, f.o.b. St. Louis:

Charcoal Foundry.		
Missouri.....	\$20.00 @	\$21.00
Southern.....	20.00 @	21.50
Coal and Coke Irons.		
Southern.....	19.00 @	19.50
Ohio Softeners.....	21.00 @	23.00
Mill Iron.		
Southern.....	17.00 @	18.00
Car-Wheel and Malleable Irons.		
Southern.....	21.00 @	24.00
Lake Superior.....	22.50 @	23.50
Connellsville Coke at East St. Louis.....		5.85

## Cleveland.

CLEVELAND, January 23, 1888.

**Iron Ore.**—The extreme cold weather in the Northwest has put a stop to all rail shipments. Furnacemen from the interior have been in the city during the week, not for the purpose of making contracts for the coming season, but to buy the surplus Ore on the docks. Probably 10,000 tons have been sold since the middle of the month at prices fully equal to prevailing quotations. Mills and furnaces are not being overrun with orders and the furnacemen are consequently not pressing negotiations for season contracts. The vesselmen are likely to have an interesting time waiting for charters with last season's prices as a basis for negotiations. It may be three or four weeks before any substantial contracts are closed. The vesselmen have formally fixed upon the following rates: Ashland, \$2; Marquette, \$1.65; Escanaba, \$1.40. The mine owners offer 90¢ from Escanaba, \$1.35 from Marquette and \$1.50 @ \$1.55 from Ashland. Selling prices for Ore already on the docks are:

No. 1 Specular and Magnetic Ores, Bessemer quality.....	\$6.50 @	\$7.00
No. 1 Specular and Magnetic Ores, non-Bessemer quality.....	6.00 @	6.50
Red Hematite Ores, Bessemer quality.....	5.75 @	6.00
Red Hematite Ores, non-Bessemer quality.....	5.00 @	5.50
Menominee Range Ores, Bessemer quality.....	5.50 @	6.25
Menominee Range Ores, non-Bessemer quality.....	4.75 @	5.25
Gogebic Range Ores, Bessemer quality.....	5.50 @	6.00
Ores for Mill use.....	6.00 @	7.00

**Pig Iron.**—The market defies intelligent analysis. Sales have been scattering and in small lots. There is no demand

except for immediate delivery, and prices are certainly several points off. Notwithstanding these facts dealers report the market "quiet but far from dull," with an encouraging outlook for February. The situation is not very encouraging to producers. The high prices paid for Ore and the present quotations for Pig Iron leave the manufacturer without a profit, if, indeed, he does not sell his product at an actual loss. Cash quotations, f.o.b., are as follows:

Nos. 1 to 6 Lake Superior Charcoal.....	22.00 @	22.50
No. 1 Strong Foundry, Bessemer quality, ½ ton.....	20.00 @	20.50
No. 1 Strong Foundry, ½ ton.....	19.50 @	20.00
No. 2 Strong Foundry, ½ ton.....	18.50 @	19.00
No. 1 American Scotch, ½ ton.....	19.85 @	20.35
No. 2 American Scotch, ½ ton.....	18.35 @	18.85
No. 1 Soft Silvery, ½ ton.....	19.00 @	20.00
Mahoning and Shenango Valley Neutral Mill Irons, ½ ton.....		17.35
Mahoning and Shenango Valley Red Short Mills, ½ ton.....		17.50

**Old Rails.**—The market is still very dull, a small lot of Tees at \$23 being the only transaction reported. Old Wheels have sold during the week for \$20.50.

**Nails.**—Inquiries and sales have both been so numerous that prices are calculated to go up a point or two next week. Iron Nails are quoted at \$1.95, 60 days, 2% off for cash.

## Detroit.

CHARLES HIMROD & Co., dealers in Iron, Detroit, Mich., report, under date of January 23, 1888, as follows: From the car industry alone there has been a sufficient call for Foundry and Wheel Iron to make a very active market in itself. It has been stated that 50% of the total number of cars ordered in 1887 have been ordered since the 1st of January, indicating a very active trade in this particular, and giving an additional stimulus to the strong market for Lake Superior Charcoal, and checking the weakness exhibited for certain grades of Foundry Iron. Large orders were placed here last week for Lake Superior Charcoal at full prices, while there is also a large demand from the East. Foundry Iron from the South seems stronger than the Northern grades at this time. Particularly may this be said of Gray Forge, which seems further sold ahead than the higher grades of Foundry Iron. We quote the market as follows:

Lake Superior Charcoal, all numbers.....	\$22.00 @	\$23.00
Lake Superior Coke, All Ore.....	21.50 @	22.00
Lake Superior Coke, Cinder Mixed.....	19.00 @	20.00
Standard Ohio Blackband.....	21.50 @	22.00
Southern No. 2.....	19.50 @	20.00
Southern Silvery.....	18.50 @	19.00
Jackson County, Ohio, Silvery.....	20.50 @	21.00
American Old Iron Rails.....	25.00 @	26.00
Old Wheels.....	21.00 @	22.00

## Coal Market.

The Anthracite Coal situation has not changed perceptibly compared with one week ago, either as to prices or prospect. If anything, prices are firmer, but Coal is in very fair supply, excepting Pea and Chestnut, which are scarce and sometimes obtained with difficulty. Stove Coal is quite plenty. Lehigh and Wilkesbarre are quoted f.o.b. net as follows: Broken, \$4.15; Egg, \$4.30; Stove, \$4.75; Chestnut, \$4.75. All Coal received is in demand. In the general market the principal operators quote about as follows, alongside: Stove, \$5 @ \$5.25, alongside; Chestnut, \$5.50; Pea, f.o.b., \$3.50 @ \$3.60. The opinion expressed respecting the miners' strike is that while prospects are as much clouded as ever there are some signs of weakness in the Schuylkill region, which may precede the end. At the same time, it is nowhere claimed that more than a half dozen collieries are working, and these are severely crippled from the impossibility of securing an adequate working force. In the Wyoming region alone is Coal production unchecked.

Supplies from that source, together with increased receipts of Coke and Bituminous Coal, afford a measure of relief. Dust and Pea are also used more generally by the furnace companies.

The total production of the mines for the week ending January 21 is again quite liberal, but shows a falling off compared with the previous week equal to 100,000 tons, due to severe weather at the mines. The figures are 555,517 tons, against 565,000 for the corresponding week last year, and the aggregate since January 1 is 1,705,313 tons, as compared with 1,608,000 tons for the same time last year, showing that even under existing embarrassments the Wyoming region under pressure is capable of making good the deficiency resulting from idleness in the Lehigh and Schuylkill regions. For the last week Schuylkill produced 20,000 tons; Lehigh, 44,000 tons; Wyoming, 491,357 tons.

## Metal Market.

**Copper.**—On Thursday of last week Chili Bars had declined all the way to £74. 10/, and in our own market the price had given way to 15.80¢ @ 15.85¢, spot, and 15.90¢ @ 15.95¢, February, when the intelligence spread that the Tamarack Company had made a sale of its entire output for three years to come, amounting to something like 50,000,000 lb Fine, at 13¢, plus half the advance that may be realized over and above that figure. It is stated that some of the smaller mines have entered into a similar arrangement. Our market thereupon at once displayed great activity, with a rapid recovery in values. Sales on the Metal Exchange the same day summed up over 1,000,000 lb at an advance of 10 @ 20 points, say, 15.90¢ @ 15.95¢ for spot; 15.95¢ for January; 16.05¢ @ 16.10¢ for February; 16.05¢ @ 16.15¢ for March; 16.25¢ for April; 15.90¢ for May; 15.50¢ @ 15.60¢ for June, and 15.25¢ for July. London improved on Friday to £75. 7/6, and in this market enough was sold to bring the aggregate turnover during the last three days of last week to 3,000,000 lb, 16.55¢ being paid for spot, 16.40¢ @ 16.55¢ for February, 16.70¢ @ 16.80¢ for March, and 16.90¢ for April. "It is estimated that at the rate at which Calumet and Hecla has been producing mineral of late the output for January will be fully 1650 tons, against 1503 tons in December." This would be equivalent to about 2,500,000 lb Fine Copper. On the 21st there was another cave at No. 1 Hecla shaft, and while it is acknowledged by representatives of the company that this is a temporary setback, it is believed that the opening of the mine will not long be delayed. The sales in London, which had summed up 600 tons on Friday for the day, came 300 tons on Monday, Chili Bars advancing to £78.5/. Some 900,000 lb again changed hands on this side at following rates: February, at 16.75¢ @ 17.45¢; March, 17¢ @ 17.65¢; April, 17.50¢ @ 17.75¢; and May, at 17.40¢. Yesterday, London had a 30/ drop to £75 15/, with sales of 375 tons. The speculation here was light, sales not exceeding 350,000 lb at 17.15¢ for spot, 16.55¢ @ 16.70¢ for February; 16.70¢ for March; 16.75¢ @ 16.90¢ for April, and 16.50¢ for July. To-day sales of spot were made at 16.40¢, March selling at 16.65¢, April at 16.65¢ @ 16.70¢, and July at 16.35¢, the aggregate transactions on the first call being 500,000 lb. It is reported that parties connected with the Cotton Exchange, are selling. Manufacturers are doing very little, making every effort to get along without entering the market, a course in which they are reported to be sustained by the fact that there is little demand for manufactured goods. Those who believe in the maintenance of present values, or hope

for even higher prices, insist that manufacturers must ultimately become heavy buyers, and argue that it would take but little to secure what Copper is in hand. They point to the heavy exports during the past few weeks, and that is certainly a feature which deserves attention. From January 1 to January 20 the exports aggregated 3,412,000 pounds of Ingot and 2839 tons of Matte, estimated to contain 10,000,000 pounds Fine Copper. A fact not to be neglected is also that the lake mines are shipping Ingot by rail as fast as produced. Therefore, instead of entering the spring with the usual heavy stocks on the lake, there will be practically nothing there. Casting brands are reported scarce, with Baltimore held at 15½¢.

**Tin.**—The market has been steady, but dull, with London unchanged from day to day at £166. /10 for spot and £144 for futures, while our market closes with 36.60¢ bid and 37¢ asked for January; 35.60¢ bid and 35.95¢ asked for February, and 34.05¢ and 34.20¢ respectively, for March. **Tin Plates.**—The fuss and furor occasioned by the possible interference of the French syndicate has pretty much subsided, and the belief is expressed in some quarters that nothing will come of it all. The makers themselves, unaided by outside capital, can do little in the way of manipulating the market, as past experience has not infrequently shown, and from present indications it is very problematical if outside assistance will be secured. In the foreign market prices are strong on certain special brands of Cokes, which is the result of a somewhat brisker demand. Terns are also showing a little more activity abroad. Here prices are practically the same as they have been, though near-by deliveries are rather stronger, with futures, however, weak. The stock of Cokes is very light in this market, and Terns are only fairly plentiful. The stocks abroad on the 1st of January were estimated at 207,800 boxes, as compared with 311,600 boxes a year ago. The New York market rules at about the following quotations for large lots: Siemens-Martin Steel, Charcoal finish, \$5.25 @ \$5.37½; ditto Coke finish, \$5; Terns, \$4.35 @ \$4.50; and Bessemer Coke, \$4.80 @ \$4.85.

**Lead.**—There have been speculative purchases from refining works aggregating about 1000 tons, on the basis of 4.90¢, New York, the buyer having the chance of diverting to any of the three leading markets. At the Exchange about 350 tons of March Lead have been sold to-day at 4.95¢ and 4.97½¢. The market closes at 4.95¢ @ 5¢ for spot.

**Spelter.**—This market is quiet, but firm, at 5½¢ @ 5½¢ for Western, with very little available at the lower figure. From the Joplin district come reports of a general suspension of mining there owing to the cold weather, and a consequent scarcity of ore, for which \$27 a ton has been paid, with an upward tendency.

#### New York Metal Exchange.

The following sales are reported:

THURSDAY, January 19.	
25,000 lb Copper, March	16.05¢
50,000 lb Copper, June	15.50¢
50,000 lb Copper, July	15.25¢
100,000 lb Copper, January	15.95¢
30,000 lb Copper, March	16.10¢
75,000 lb Copper, April	16.25¢
50,000 lb Copper, January	15.95¢
75,000 lb Copper, March	16.15¢
25,000 lb Copper, February	16.00¢
50,000 lb Copper, June	15.60¢
25,000 lb Copper, February	16.05¢
25,000 lb Copper, February	16.1¢
75,000 lb Copper, April	16.35¢
25,000 lb Copper, May	15.25¢
50,000 lb Copper, July	15.35¢
25,500 lb Copper, spot	15.30¢
50,000 lb Copper, spot	15.30¢
FRIDAY, January 20.	
25,000 lb Copper, February	16.15¢
125,000 lb Copper, April	16.45¢

50,000 lb Copper, April	16.50¢
50,000 lb Copper, June	15.70¢
50,000 lb Copper, July	15.40¢
50,000 lb Copper, July	15.50¢
50,000 lb Copper, February	16.25¢
160,000 lb Copper, April	16.50¢
175,000 lb Copper, spot	16.20¢
25,000 lb Copper, spot	16.25¢
100,000 lb Copper, February	16.25¢
75,000 lb Copper, April	16.65¢
10 tons Tin, March	34.10¢
10 tons Tin, March	34.15¢
25,000 lb Copper, April	16.65¢
300,000 lb Copper, April	16.70¢
100,000 lb Copper, February	16.80¢
100,000 lb Copper, April	16.70¢
50 tons Lead, February	4.85¢

SATURDAY, January 21.

10 tons Tin, March	34.00¢
10 tons Tin, April	33.25¢
50,000 lb Copper, February	16.40¢
25,000 lb Copper, February	16.45¢
100,000 lb Copper, March	16.70¢
50,000 lb Copper, March	16.75¢
25,000 lb Copper, March	16.80¢
25,000 lb Copper, February	16.50¢
25,000 lb Copper, February	16.55¢
100,000 lb Copper, spot	16.90¢
25,000 lb Copper, April	16.90¢

MONDAY, January 23.

25,000 lb Copper, February	16.75¢
25,000 lb Copper, March	17.00¢
150,000 lb Copper, February	17.00¢
10 tons Tin, April	33.30¢
25,000 lb Copper, February	17.00¢
50,000 lb Copper, March	17.15¢
100,000 lb Copper, March	17.20¢
25,000 lb Copper, April	17.30¢
25,000 lb Copper, April	17.6¢
25,000 lb Copper, March	17.65¢
75,000 lb Copper, April	17.75¢
175,000 lb Copper, February	17.40¢
25,000 lb Copper, February	17.45¢
25,000 lb Copper, March	17.6¢
75,000 lb Copper, April	17.70¢
32 tons Lead, February	4.95¢
10 tons Lead, March	4.97½¢
50,000 lb Copper, April	17.70¢
25,000 lb Copper, May	17.40¢

TUESDAY, January 24.

66 tons Lead, May	4.95¢
100,000 lb Copper, spot	17.15¢
32 tons Lead, February	4.95¢
25,000 lb Copper, July	16.50¢
25,000 lb Copper, February	16.70¢
25,000 lb Copper, February	16.60¢
25,000 lb Copper, February	16.55¢
25,000 lb Copper, February	16.85¢
50,000 lb Copper, April	16.40¢
50,000 lb Copper, March	16.70¢
25,000 lb Copper, April	16.75¢
25,000 lb Copper, April	16.90¢
25,000 lb Copper, April	16.90¢

WEDNESDAY, January 25.

100,000 lb Copper, spot	16.40¢
75,000 lb Copper, March	16.65¢
25,000 lb Copper, April	16.70¢
25,000 lb Copper, April	16.75¢
25,000 lb Copper, May	16.65¢
50,000 lb Copper, July	16.85¢
150,000 lb Copper, spot	16.70¢
25,000 lb Copper, April	16.65¢
100,000 lb Copper, March	16.65¢
50,000 lb Copper, April	16.65¢
100 tons Lead, March	4.95¢
222 tons Lead, March	4.97½¢

#### Old Metals, Rags, &c.

The purchasing prices offered by dealers are as follows:

Heavy Copper	\$0.10 @ \$0.12
Light Copper	.. .. . @ .09
Copper Bottoms	.. .. . @ .09
Brass, Heavy	.. .. . @ .08½
Brass, Light	.. .. . @ .06½
Composition	.. .. . @ .012 @ .12
Lead, Heavy	.. .. . @ .08½
Tea Lead	.. .. . @ .04
Zinc	.. .. . @ .03 @ .03½
Wrought Iron	.. .. . ton, 18.00 @ ..
Light Iron	.. .. . ton, 10.00 @ ..
Stove Plate Iron	.. .. . ton, 10.00 @ ..
Machinery Iron	.. .. . ton, 13.00 @ 13.50
Grate Bars	.. .. . ton, 7.00 @ ..
Old Rubber	.. .. . @ .04 @ .04½
White No. 1	.. .. . @ .03½ @ .03¾
White No. 2	.. .. . @ .01½ @ .01¾
Canvas, Linen, No. 1	.. .. . @ .04 @ .04½
Canvas, Cotton, No. 1	.. .. . @ .04½ @ .04¾
Canvas, No. 2	.. .. . @ .02½ @ .02¾
Seconds	.. .. . @ .01 @ .01½
Roof Woolens	.. .. . @ .06½ @ .07
Mixed Rags	.. .. . @ .01 @ .01½
Gunny Bagging, No. 1	.. .. . @ .02½ @ .02¾
Auto Butts	.. .. . @ .02½ @ .02¾
Book Stock	.. .. . @ .007 @ .01
Newspapers	.. .. . @ .004 @ .004½
Waste Paper	.. .. . @ .004 @ .004½
Hemp Twine	.. .. . @ .02½ @ .03
Sisal Baling Rope	.. .. . @ .02 @ .03

Mr. C. E. Bassett, of Detroit, informs us that a company has been formed in that city, known as the Baker Smelting Company, with the object of working lead and copper ores in Southern Utah. The smelting works are to be in operation about the 10th of February, the ores being procured both from their own mines and from other sources. The officers of the company are R. B. Rouse, president; A. Kast, vice-president; Geo. W. Edson, treasurer, and W. N. Brainard, secretary, the office being at Detroit.

#### Exports.

The following table presents the exports of Hardware, Iron, Steel, Metals, &c., from the port of New York for the week ending January 24, 1888:

Argentine Republic			Quan.	Val.
Ag. imp. pks	840	7,305		
Plated ware,				
cs.	4	495		
Mach'y, pks.	1	373		
Revolvers, cs.	3	1,304		
Antwerp.				
Sew. ma. cs.	60	975		
Mach'y, pks.	1	200		
Hdw., cs.	4	75		
Amsterdam.				
Hdw., cs.	1	176		
Augsburg.				
Ag. imp. pks	1	9		
British Australia.				
Ag. imp. pks	1	15		
Hdw., pks.	19	907		
Cutlery, cs.	6	138		
British East Indies.				
Rifles, cs.	3	300		
Clocks, cs.	14	263		
Cartridges, cs.	25	590		
Pumps, pks.	2	125		
British West Indies.				
Mf. iron, pks	84	396		
Tinware, cs.	3	68		
C. sheathing, case	1	65		
Hdw., pks.	10	140		
Nails, kegs.	4	15		
Sew. ma., cs.	2	28		
Bremen.				
Metal bxs.	10	370		
Hdw., cs.	2	100		
Mch'y, pks.	3	800		
Mf. iron, pks.	4	65		
Sew. ma., cs.	2	118		
Ptg. presses, pks.	25	1,120		
Brazil.				
Ag. imp. pks	35	107		
Clocks, cs.	8	278		
Car wheels	50	246		
Pumps, pks.	4	103		
Mf. iron, pks	3	55		
Hdw., pks.	67	1,026		
Sew. ma., cs.	27	517		
Mach'y, pks.	4	169		
Bristol.				
Hdw., cs.	2	20		
Bradford.				
Mf. iron, pks	21	100		
Canned g'ds, cs.	4	30		
Berlin.				
Sew. mach. cs	4	200		
Mach'y, pks.	1	200		
Batoum.				
Mach'y, pks.	2	230		
British Honduras.				
Sew. ma., cs.	28	437		
Hdw., pks.	5	83		
Clocks, cs.	6	38		
Cutlery, cs.	2	92		
Bolivia.				
Mach'y, pks.	62	2,272		
Copenhagen.				
Mach'y, pks.	1	125		
Hdw., pks.	1	53		
Constantinople.				
Hdw., cs.	1	75		
Charkow (Russia).				
Ag. imp. pks	7	380		
Cuba.				
Mach'y, pks.	221	3,585		
Hdw., pks.	144	1,825		
Mf. iron, pks	806	3,847		
Tacks, cs.	1	14		
Ag. imp. pks.	27	1,071		
Iron, pks.	15	177		
Iron rails.	138	250		
Clocks, cs.	3	85		
Nails, cs.	8	43		
Car wheels.	20	152		
Pumps, pks.	6	738		
Nails, kegs.	290	688		
Boilers.	3	4,367		
Wire rope, reels.	3	200		
Cutlery, cs.	12	305		
Tin, cs.	5	52		
Wire goods, cs.	4	98		
Brass tubes.	100	126		
Central America.				
Ox shoes, bxs	20	265		
Mf. iron, pks	302	1,370		
Sew. ma., cs.	89	1,988		
Ag. imp. pks.	17	231		
Cartridges, cs.	8	235		
Cutlery, cs.	9	187		
Iron, pks.	147	557		
Nails, cs.	122	358		
Horse shoes, kegs.	21	115		
Hdw., pks.	64	1,023		
Firearms, cs.	7	583		
Boiler.	1	8,300		
Pumps, pks.	12	468		
China.				
Steel, pks.	5	50		
Still.	1	2 50		
Quicksilver, flasks.	5	250		
Christiana.				
Hdw., pks.	19	300		
Clocks, cs.	2	50		
Agateware, cs	4	84		
Stamped w, cs	2	30		
Nails, cs.	1	2		
Chile.				
Hdw., pks.	18	472		
Chemnitz.				
Mach'y, pks.	1	370		
Dutch West Indies.				
Mf. iron, pks	9	104		
Zinc, case.	1	40		
Hdw., pks.	13	173		
Wash. mach.	2	14		
Nails, bxs.	18	179		
Danish West Indies.				
Nails, kegs.	5	18		
Dutch East Indies.				
Cutlery, case.	1	25		
Japan.				
Clocks, pks.	1142	20,042		
Tram bar	1	3,450		
Ag. imp. pks	22	325		
Cartridges, cs.	10	215		
Ammunition, cs.	4	100		
Air guns, cs.	2	250		
Mach'y, pks.	94	15,510		
Hdw., pks.	214	3,605		
Brass goods, case.	1	80		
Wire, cs.	3	754		
Mf. iron, pks	59	680		
Pistols, cases.	2	210		
Rifles, case.	1	180		
Leghorn.				
Clocks, box.	1	25		
Copp'r matte, bags.	12,803	78,000		
Liverpool.				
Clocks, cs.	120	2,780		
Mf. iron, pks	1	41		
Guns, case.	1	500		
Copper, csks	516	114,285		
Mach'y, pks.	21	3,080		
Ag. imp. pks	6	250		
Hdw., pks.	72	1,088		
Sew. ma., case.	1	15		
Copper matte, bags.	15,888	99,380		
Cutlery, cs.	2	100		
London.				
Clocks, pks.	102	1,650		
Steel, case.	1	125		
Sew. ma., cs.	49	1,888		
Hdw., pks.	56	1,333		
Copper casks.	180	40,500		
Mach'y, pks.	6	1,050		
Ag. imp. pks	54	1,480		
Mf. iron, pks	7	72		
Laispiz.				
Mach'y, pks.	2	200		
Mexico.				
Hdw., pks.	166	2,220		
Tinware, cs.	3	50		
Mach'y, pks.	41	1,818		
Nails, cs.	11	80		
Ag. imp. pks	13	111		
Iron, pks.	25	400		
Print g press, cs	8	510		
Clocks, cs.	5	60		
Firearms, cs.	3	300		
Cutlery, cs.	12	205		
Sew. ma., cs	163	2,547		
Mf. iron, pks	874	4,849		
Nails, kegs.	185	318		
Bell.	1	25		
Steam pump.	1	577		
Cartridges, cs	18	320		
Rotterdam.				
Mch'y, pks.	3	205		
Hdw., pks.	12	200		
Porto Rico.				
Haw. pks.	4	40		
Mach'y, pks.	3	100		
Mf. iron, pks	23	162		
Copper, case	1	32		
Nails, kegs.	5	41		
Ag. imp. pks.	2	180		
Peru.				
Hdw., pks.	33	200		
Cutlery, cs.	2	40		
Philippines.				
Forges.	6	100		



Odessa.	
Quan. Val	
Ag. imp. pkgs. 15	1,924
United States of Colombia.	
Mchy. pkgs. 3	490
Hdw., pkgs. 31	614
Nails, cs. 24	590
Ag. imp. pkgs. 4	101
Iron reforts. 3	1,020
Iron, pcs. 33	193
Lead, case. 1	35
Mf. iron, pkgs. 310	1,718
Cutlery, cs. 2	68
Sew. ma., cs. 40	675
Nails, kegs. 5	36
Clocks, cs. 2	21
Steel, pcs. 328	1,599
Metal, bars. 3	71
Uruguay.	
Pumps, pkgs. 2	150
Hdw., pkgs. 128	2,306
Railroad cars. 5	9,910
Tacks, cs. 50	198
Wire goods, cs. 5	104
Cutlery, cs. 15	450
Ag. imp. pkgs. 385	6,318
Arms, cs. 7	2,015
Sew. ma., cs. 35	640
Clocks, cs. 5	103
S. nails, cs. 50	170
Car wheels. 64	420
Venezuela.	
Hdw., pkgs. 236	2,636
Cutlery, cs. 36	833
Mach'y, pkgs. 302	14,095
Nails, kegs. 104	231
Pumps, pkgs. 1	48
Cartridges, cs. 12	210
Triplate, cs. 22	146
Boiler, cs. 1	900
Ag. imp. pkgs. 5	29
Mf. iron, pkgs. 3,732	14,338
Sew. ma., cs. 34	2636
Nails, cs. 52	437
Clocks, cs. 9	267
Arms, cs. 9	1,941
Spikes, kegs. 12	67
Iron, pkgs. 27	86
Mf. of copper, case. 1	48
Ecuador.	
Nails, case. 1	2
Sew. ma., cs. 38	1,460
Mach'y, pkgs. 10	525
Pumps, pkgs. 13	658
Mf. iron, pkgs. 101	415
Cutlery, cs. 1	50
Loco, wheels. 11	550
Iron axles. 4	100
Genoa.	
Guns, cs. 124	23,250
Hdw., cs. 28	273
B. metal case. 1	49

## Exports of Metals.

	Jan. 16 to Jan. 20, 1888.	Jan. 1 to Jan. 20, 1888.
Copper: F. A. Lomal.....	400,000	500,000
J. Abbott & Co.....	281,804	1,581,804
Lewisohn Bros.....	212,500	212,500
S. Mendal.....	112,000	112,000
Thos. J. Pope, Sons & Co..	65,000	115,000
American Metal Co.....	25,000	540,860
Copper Matte: Williams & Ter-		
nune.....	3,778,266	5,678,976
Old Copper: Burgess & Co.....	88,564	113,857
Old Brass: Phelps Bros.....	30,475	30,475

## Imports.

The imports of Iron and Steel, Hardware, &c., at this port from January 16 to January 20, inclusive, were as follows:

## Iron and Steel.

	Jan. 16 to Jan. 20, inc.	Jan. 1 to Jan. 20, inc.
Pig Iron: G. W. Stetson & Co.....	250	550
Crocker Bros.....	200	400
Baldwin Bros. & Co.....	100	10
R. Crooks & Co.....	100	400
N. S. Bartlett.....	100	700
A. Milne & Co.....	15	15
Steel: A. Milne & Co.....	32	76
W. F. Wagner.....	55	85
M. Cohn.....	7	25
E. Losa.....	2	2
Steel Rods: Naylor & Co.....	20	832
J. Abbott & Co.....	300	300
A. Heyn.....	172	150
F. S. Pilditch.....	12	12
Montgomery & Co.....	25	25
Iron Ore: R. de Flores.....	689	679
Iron: J. Abbott & Co.....	100	637
C. Van Philp.....	14	14
Steel Plates: Houdoulette & D.....	18	52
Steel Sheets: Pierson & Co.....	47	96
Naylor & Co.....	6	11
C. F. Boker.....	2	2
Steel Bars: A. Milne & Co.....	30	30
N. Lilienberg.....	5	5
C. A. Walsdrif.....	6	6
Steel Blooms: A. Milne & Co.....	4	4

## French Guiana.

Quan. Val.

Nails, kegs. 15 42

Hdw., pkgs. 6 39

## French West Indies.

Ag. imp. pkgs. 4 24

## Gottenburg.

Clocks, pkgs. 71 1,142

Hdw., pkgs. 98 1,985

## Glasgow.

Mach'y, pkgs. 18 7,960

Clocks, pkgs. 79 1,518

Wringers, cs. 16 216

W. mills, pkgs. 5 55

Hdw., pkgs. 12 573

Sew. ma., cs. 670 6,744

## Gloucester.

Mach'y, pkgs. 1 175

## Hong Kong.

Hdw., pkgs. 16 409

Nails, kegs. 35 85

Sew. ma., cs. 6 97

Mf. iron, pkgs. 34 310

Carbines, cs. 5 430

Clocks, pkgs. 264 4,992

## Hauti.

Sew. ma., cs. 45 525

Nails, kegs. 58 130

Mf. iron, pkgs. 16 85

Hdw., pkgs. 20 247

Tin, bxs. 5 40

Anchors. 6 12

Pumps, pkgs. 2 31

## Hull.

Mach'y, pkgs. 173 2,450

Hdw., pkgs. 78 1,792

Clocks, pkgs. 30 414

Mf. iron, pkgs. 1 9

Pumps, pkgs. 1 35

Ag. imp. pkgs. 1 15

## Hamburg.

Wringers, cs. 52 750

Old brass, 30,475 2,500

Mach'y, pkgs. 28 3,500

Clocks, cs. 8 84

Tin plate, bxs 50 500

Hdw., pkgs. 27 1,334

Sew. ma., cs. 37 979

Mf. iron, pkgs. 1 25

Mf. steel, pkgs. 11 1,155

Ag. imp. pkgs. 45 1,942

## Haere.

Copper, pigs. 552 21,866

Hdw., cs. 3 31

Mf. iron, pkgs. 2 15

Ag. imp. pkgs. 24 1,600

Mach'y, pkgs. 6 1,900

Copper, cases 305 62,520

Sew. ma., cs. 137 3,675

Clocks, cs. 3 35

## Ipswich.

Mach'y, pkgs. 1 16

Metal goods, pkgs. 11 1,137

## Steel Rods: R. H. Wolff

&amp; Co. 26 26

Sheet Iron: T. B. Coddington

ton &amp; Co. 15 144

Rivet Rods: J. Abbott &amp; Co. 10 111

Nail Rods: J. Abbott &amp; Co. 75 100

Screw Rods: American 82 82

Wire Rods: R. F. Downing &amp; Co. 12 12

Charcoal Iron: Page, Newell &amp; Co. 5 5

Iron Beams: R. F. Downing &amp; Co. 15 15

Iron Wire: J. A. Roeb- ling &amp; Sons 50 50

## Tin Plates.

Boxes. Boxes.

Pratt Mfg. Co. 6,136 8,974

T. B. Coddington &amp; Co. 2,732 10,043

Dickerson, Van Duzen &amp; Co. 1,812 25,598

N. L. Cort &amp; Co. 1,000 10,238

Bruce &amp; Cook. 869 5,367

H. Whittemore. 460 1,494

## Metals.

Pounds. Pounds.

Tin: Crooke S. and Rfg. Co. 22,130 44,558

Hendricks Bros. 14,471 28,831

Nickel: McCoy &amp; Sand- ers 5,000 15,000

Antimony: Edw. Hill's Sons &amp; Co. 50 250

## Hardware, Machinery, &amp;c.

Bates, Carl F., Hdw., cs. 11	
Boker, Hermann & Co., Arms, cs. 15; Hdw., cs. 3	
Dolge, Alfred, Mdse., cs. 11	
Graef Cutlery Co., Mdse., cs. 11	
Kastor, A., Mdse., cs. 10	
Knobel, H. & Co., How., cs. 2	
Kurshead Mfg. Co., Mach'y, pkgs., 17	
McCoy & Sanders, Hdw. and Cut'y, case 1	
Morris, L. W. & Son, iron machines, case 1	
Marshall & Co., Mach'y, case 1	
Schloss & Son, Mach'y, cs. 2	
Schmidt, Wm., Anvil and accessories.	
Schovering, A., Arms, cs. 4	
Strauss, Blumenthal & Co., Hdw., cs. 6	
Tryon, E. K. & Co., Arms, cs. 2	
Uhlmann, S. & F., Mach'y, pkgs., 116	
Vom Cleff & Co., Razor Hones, cs. 34	
Warrior Mower Co., Ag. Machines, pkgs., 63	
Wiebusch & Hilger, Hdw. and Cut'y, pkgs., 22; Mdse., cs. 3	
Witte, John G. & Bro., Cutlery cs., 4	

Irons and Metals Warehoused from January 16 to January 20, inclusive:

	Tons.
Old Iron Rails: W. H. Crossman & Co. ....	1,065
Neumark & Gross.....	150
Rivet Rods: Page, Newell & Co.....	61
Scrap Iron: Jas. E. Ward & Co. ....	50

## Paints, Oils, &amp;c.

## Paints.

Black, Lamp—Coach Painters'.....	12 @ 21¢
Ordinary.....	6¢
Black, Ivory Drop, fair.....	12 @ 15¢
best.....	23¢
Black Paint, in oil.....	11¢
Blue, Prussian, fair to best.....	40 @ 55¢
in oil.....	45 @ 55¢
Chinese dry.....	70¢
Ultramarine.....	18 @ 30¢
Brown, Spanish.....	14¢
Van Dyke.....	10 @ 12¢
Dryers, Patent American, ass'd cans, 9¢; kegs, 7¢	
Green, Chrome.....	15 @ 23¢
Green, Chrome in oil.....	14 @ 18 @ 25¢
Green, Paris.....	good, 20¢; best, 25¢
Green, Paris in oil.....	good, 30¢; best, 35¢
Iron Paint, Bright Red.....	12 @ 24¢
Iron Paint, Brown.....	12 @ 15¢
Iron Paint, Purple.....	12 @ 3¢
Iron Paint, Ground in oil, Bright Red.....	12 @ 61¢
Iron Paint, Ground in oil, Red.....	12 @ 55¢
Iron Paint, Ground in oil, Brown.....	12 @ 51¢
Iron Paint, Ground, Purple.....	12 @ 6¢
Litharge.....	61¢
Mineral Paints.....	2 @ 4¢
Orange Mineral.....	10¢
Red Lead, American.....	61¢
Red Venetian (Eng.) dry.....	\$1.65 @ \$1.70
Red Venetian in oil.....	ass'd cans, 11¢; kegs, 8¢
Red Indian Dry.....	3 @ 13¢
Rose Pink.....	10 @ 13¢
Sienna, American Raw, powdered.....	4¢
Sienna, Burnt, powdered.....	10 @ 16 @ 20¢
Sienna, Raw.....	11 @ 15 @ 25¢
Umber, Burnt, powdered.....	4 @ 8¢
Umber, Burnt, in oil.....	9 @ 12 @ 15¢
Umber, Raw, powdered.....	4 @ 71¢
Umber, Raw, in oil.....	9 @ 12 @ 15¢
Vermillion, Chinese.....	90¢
Vermillion, English.....	70 @ 71¢
Vermillion, American Common.....	15¢
White Lead, American pure dry.....	6¢
White Lead, American pure dry, in oil.....	7 @ 71¢
White Paris, English Prime.....	2 @ 24¢
Yellow Ocher, French.....	\$1.75
Yellow Ocher, French, in oil.....	10 @ 11¢
Yellow Ocher, Vermont.....	in casks, 14¢
Yellow Chrome.....	17 @ 27¢
Yellow Chrome, in oil.....	11 @ 18 @ 25¢
Zinc White, American No. 1, dry.....	5 @ 6¢
Zinc White, American No. 1, in oil.....	9¢
Zinc White, French (Paris Dry).....	67¢ @ 73¢
Zinc White, French, in oil.....	10 @ 11¢

## Sundries.

Asphaltum, Cuban, 1/2 lb.....	51¢ @ 61¢
Asphaltum, Egyptian.....	8 @ 36¢
Benzine, 62°, 1/2 gal.....	8 1/2 @ 36¢
Coal Tar, 100 lb.....	1/2 bbl., \$3.00 and \$4.00
Chalk, 1/2 100 lb.....	45¢
Crucibles, No. 14 and upward, 1/2 number.....	38¢
Grain Emery, 300 lb kegs.....	4 @ 14¢
Flour Emery, finest quality.....	2 1/2 @ 25¢
Glue, White.....	18 @ 35¢
Glue, Sheet.....	13 @ 20¢
Glaziers' Points, Zinc, 1/2 box.....	\$1.75
Gum, Copal.....	36¢
Gum, Damar.....	25¢
Gum, Shellac, English.....	30¢
Gum, Shellac, English, dark.....	27¢
Mineral Wool, ordinary, 1/2 lb.....	1 @ 11¢
Mineral Wool, extra.....	3 @ 34¢
Naphtha, 70°.....	9 @ 11¢
Naphtha, 76°.....	9 1/2 @ 10 1/2¢
Pumice Stone, selected lumps.....	3 @ 6¢
Pumice Stone, powdered.....	2 @ 21¢
Pine Tar, bbls.....	\$2.10 @ \$2.12 1/2
Pitch.....	\$1.40
Plumbago, E. I. Po., 1/2 lb.....	4 @ 6¢
Plumbago, American, 1/2 lb.....	6 @ 10¢
Plumbago, Gun Powder Glazing, 1/2 lb.....	11¢
Plumbago, Shot Polish, 1/2 lb.....	10¢
Putty, in bladders.....	2 1/2¢
Putty, in bulk.....	13¢ @ 2¢
Rosin, Strained and Good.....	\$1.31 1/2 @ \$1.37 1/2
Rosin, E. & F.....	\$1.45 @ \$1.50
Rosin, G. & H.....	\$1.37 1/2 @ \$1.65
Rosin, I. & K.....	\$1.75 @ \$1.85
Rosin, M. & N.....	\$2.00 @ \$2.30
Spirits Turpentine, 1/2 bbl.....	41 1/2 @ 44¢
Stove Polish, Dixon's.....	1/2 gross, \$6.00
Stove Polish, Rising Sun.....	5.70
Stove Polish, Gem.....	1.50
Stove Polish, Jet Black.....	3.50
Waste, No. 1 Cop.....	84¢
Waste, No. 1 White Machine.....	84¢
Waste, No. 2 White Machine.....	84¢
Waste, No. 1 Colored.....	64¢
Waste, No. 2 Colored.....	54¢
Waste, Washed Machine.....	84¢
Whiting, Spanish, 1/2 100 lb.....	50¢

The ignition apparatus in the Atkinson cycle gas engine, which seems to have attained some prominence in England, is exceedingly simple and certain in operation. A piece of wrought-iron pipe is screwed into the end of the cylinder, and open to the ignition space, the outer end being closed. A sliding chimney surrounds the ignition tube, and is fitted with an atmospheric burner which keeps the tube red-hot; the compression in the cylinder forces some of the charge into the tube, which is ignited as soon as it comes into contact with the red-hot portion, the timing of the ignition being regulated with the greatest accuracy by sliding the chimney higher up or lower down the ignition tube. Owing to the certainty of the ignition, combined with the small amount of charge requiring to be compressed, these engines are very easily started. A man, it is said, can easily start an 8 horse-power size by turning it round through half a revolution.

A question of interest to importers in its general application was recently decided by the Appellate Court of the First District of Illinois, in the case of J. H. Brooke and others against Ferdinand Siegel and others. The plaintiffs, who are English manufacturers, sold defendants 20 pieces of stock-inets to be used in the manufacture of cloaks, but the latter refused to pay for them on the ground that the goods were covered by a patent to John Kent for an improvement in knitted fabrics, and he had given notice he would hold them liable for infringement if they bought the fabrics. The Appellate Court, by Judge Bailey, held that this patent was such a serious incumbrance on the goods as to constitute a breach in the implied warranty of title which justified defendants in refusing to take the property.

An electric railway on the trolley system has been put in successful operation in Easton, Pa. For a portion of the distance the overhead wires which conduct the currents of electricity are suspended from short arms leading out from upright poles. Where the track takes the center of the street the wires are suspended by means of other wires stretched across the street and secured by poles on each side.





## TACKS.

There is little question that the low and irregular prices that prevail on Tacks and the embarrassment suffered by many of the manufacturers on account of the extreme quotations that exist are, to some extent at least, owing to irregularities in the weight of the goods. The fact is generally conceded that many of the Tacks sold are of short weights, there not being the proper amount of goods in a package. The manner in which Tacks are designated has probably something to do in the way of encouraging this practice, inasmuch as many Hardwaremen and the great mass of the consumers of Tacks are ignorant as to the amount of goods which should be contained in a paper. The following communication from J. H. Harris, Jr., treasurer of the Auburn Tack Company, Auburn, N. Y., relates to this feature of the case, and suggests, it will be observed, a remedy—his plan being that a change should be made in the manner of designating the Tacks, and that each paper should state specifically the amount of Tacks contained in it. We take pleasure in laying Mr. Harris's suggestions before the trade:

It is my opinion that the present condition of the Tack market has been caused partly by the fact that many manufacturers have resorted to putting up their goods short weight, thereby deceiving the trade, representing that a package contains a certain amount of goods when it does not. The manner in which Tacks are now put up—i. e., Quarter Weight, Half Weight and Full Weight—gives an opportunity whereby unscrupulous Tack-makers can put short-weight goods on the market, for the reason that there are few people in the Hardware trade and no consumers who know the contents—that is, the weight per package of either Quarter, Half or Full Weight, which, of course, varies according to size of Tacks. I presume that all brother Tack manufacturers understand the origin of present designation of sizes of Tacks, but for the benefit of the trade I will explain its formation. Full Weight, 1000 Tacks  $4\frac{1}{2}$  eighths inches long weighed originally 8 ounces; 1000 Tacks  $\frac{1}{2}$  inch long weighed 10 ounces, &c. A Half-Weight paper, size 8 ounces, contained one-half the amount of a Full-Weight paper—that is, 4 ounces, a Half-Weight paper of 10 ounces containing 5 ounces. Quarter Weights should weigh one-quarter the amount of Full Weights, and of course the weights of all sizes were estimated in the same manner.

Now, as no manufacturer is making goods in accordance with this old rule, why continue to designate as 1,  $1\frac{1}{2}$ , 2,  $2\frac{1}{2}$  oz., &c.? Why not call the Tacks No. 1, No.  $1\frac{1}{2}$ , No. 2, No.  $2\frac{1}{2}$ , &c., putting them up not in Full Weights, Half Weights and Quarter Weights, but by 1 pound,  $\frac{1}{2}$  pound and  $\frac{1}{4}$  pound packages, or 16-ounce, 8-ounce and 4-ounce packages, and specifying on the labels of each package its exact weight, thus giving the trade and consumer an opportunity to find out whether or not they are getting the quantity they pay for. Furthermore, this would enable the manufacturers to establish new lists, which, of course, means new prices. I deem the above a feasible plan for overcoming the difficulty I have mentioned, and would ask through the columns of your paper the opinions of all Tack manufacturers, and all others interested.

We take pleasure in submitting this matter to the trade, manufacturers and merchants, and would suggest these inquiries:

1. Whether there are any considerable disadvantages in connection with the prevailing designation and manner of putting up Tacks?

2. Whether the proposed plan is desirable; and

3. Whether it is feasible?

Perhaps some enterprising manufacturer will be disposed to make the experiment of putting up Tacks in some such way, and thus test the feeling of the trade. Or it may be that the retailers are not desirous of knowing, and do not care to have their customers know, the actual quantity of Tacks contained in each paper.

We make the following extracts from letters received from manufacturers in reply to an inquiry as to whether they are putting on the market Tacks of specified irregular weights:

## U. S. Standard List of Chamfered, Trimmed and Reamed, Hot Pressed or Cold Punched Square or Hexagon Nuts.

Wide.	Thick.	Hole.	Bolt.	Square, cents per pound.	Hexagon, cents per pound.	Wide.	Thick.	Hole.	Bolt.	Square, cents per pound.	Hexagon, cents per pound.
$\frac{1}{2}$	$\frac{1}{4}$	$\frac{13}{64}$	$\frac{1}{4}$	20.0	27.0	$2\frac{3}{16}$	$1\frac{1}{2}$	$1\frac{1}{32}$	$1\frac{1}{2}$	9.7	11.2
$\frac{19}{32}$	$\frac{5}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	18.0	24.0	$2\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{3}{32}$	$1\frac{1}{2}$	10.5	12.0
$1\frac{1}{16}$	$\frac{3}{8}$	$\frac{19}{64}$	$\frac{3}{8}$	14.5	18.5	$2\frac{9}{16}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	10.5	12.0
$1\frac{3}{8}$	$\frac{7}{16}$	$\frac{11}{32}$	$\frac{7}{16}$	14.0	18.0	$2\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	11.0	13.0
$\frac{7}{8}$	$\frac{1}{2}$	$\frac{25}{64}$	$\frac{1}{2}$	11.3	14.0	$2\frac{11}{16}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	11.0	13.0
$1\frac{1}{2}$	$\frac{9}{16}$	$\frac{29}{64}$	$\frac{9}{16}$	11.3	14.0	$3\frac{1}{2}$	2	$1\frac{3}{32}$	2	11.5	13.5
$1\frac{1}{16}$	$\frac{5}{8}$	$\frac{33}{64}$	$\frac{5}{8}$	10.0	12.5	$3\frac{5}{16}$	2 $\frac{1}{2}$	$1\frac{13}{16}$	2 $\frac{1}{2}$	12.0	14.0
$1\frac{1}{4}$	$\frac{3}{4}$	$\frac{3}{8}$	$\frac{3}{4}$	9.4	10.9	$3\frac{1}{2}$	2 $\frac{1}{2}$	$1\frac{11}{16}$	2 $\frac{1}{2}$	12.0	14.0
$1\frac{7}{16}$	$\frac{7}{8}$	$\frac{47}{64}$	$\frac{7}{8}$	9.4	10.9	$3\frac{1}{2}$	2 $\frac{1}{2}$	$2\frac{3}{16}$	2 $\frac{1}{2}$	12.5	14.5
$1\frac{5}{8}$	1	$\frac{27}{32}$	1	9.2	10.7	4 $\frac{1}{2}$	2 $\frac{1}{2}$	$2\frac{7}{16}$	2 $\frac{1}{2}$	13.0	15.0
$1\frac{11}{16}$	$1\frac{1}{8}$	$\frac{15}{8}$	$1\frac{1}{8}$	9.2	10.7	4 $\frac{1}{2}$	3	$2\frac{11}{16}$	3	13.5	15.5
2	$1\frac{1}{4}$	$1\frac{1}{16}$	$1\frac{1}{4}$	9.7	11.2						

We are not putting Tacks on the market at other than our regular, full, half and quarter weights, except our Star brand of 3 ounces in a paper, and Steel Tacks of 2 ounces in a paper.

We have not put on the market any other weights than those put up by the late Central Mfg. Co., and do not intend to, as we think it very demoralizing to the trade to do so.

We are not putting on the market Tacks packed the special specified weights advertised by Loring & Parks, and are only offering full, half and quarter weights, except Steel Carpet Tacks, packed 2 ounces in a paper, as adopted by the Central Mfg. Company. The special short weights are more of an explanation for goods already marketed than for the convenience of the trade in ordering, as full, half and quarter weight furnish all the assortment required.

We have adopted the new Tack list and will put nothing on the market but guaranteed half and full weight goods. In our opinion special or cut weights are an abomination that should not be countenanced.

We have a few customers who ask for these special weights and have in a few instances complied with their request, but we dislike the method and discourage it all we can.

We are not putting up the scant-weight goods, as illustrated by Loring & Parks in *Iron Age*, January 5. These scant weights enable the manufacturer and jobber to undersell a short time, but there must be a limit to scanting the weight, and it seems to us that it is but a temporary expedient.

While we have done very little in the light or cut-weight business, we are, notwithstanding, prepared to pack and sell them to such of our trade as call for them.

We have not, so long as we have been in the business, put up Tacks in any other way than full weight, full half weight and full quarter weight, and do not intend doing so unless we are forced into it by the action of other manufacturers in putting on the market light-weight goods, and unless the trade demand it, which we have not as yet found to be the case. We have not sold or sent out any goods under the name of Swedes Iron excepting such as were made from genuine Swedes Iron. A great many Tacks have been sent out by different manufacturers under the name of Swedes Iron, but the goods have been made from Steel, which has caused a great demoralization in price of Swedes Iron Tacks.

We shall adopt no other method of packing Tacks other than regular full, half and quarter weight. We consider certain special weights nothing more nor less than plundering the public. The jobber may know what he is getting, and perhaps some of the retailers, but not the confiding consumer who purchases his little paper of Tacks.

Full weight has meant since the Tack business began that 8 ounces of Tacks were in an 8-ounce paper and 10 ounces of Tacks were in a 10-ounce paper. No manufacturer can now tell this whole country that 7 ounces of Tacks or 6 ounces of Tacks or 5 ounces of Tacks in an 8-ounce paper make a full-weight paper.

## TRADE TOPICS.

Relating to the suggestion which was made in our last issue, in regard to a change in the form of Keepers or Sockets for Door or Shutter Bolts, we have the following from the Stanley Works:

We notice in *The Iron Age*, of January 19, the remarks of "Old Builder," in reference to keepers for Door and Shutter Bolts. In this connection we desire to state that for several years past the Bolt Keepers, Staples and Floor Plates manufactured by this company have been made with special reference to obviating the difficulty referred to, the Flush Bolts, Store Door Bolts, &c., having Floor Plates with elongated holes to allow for shrinkage in width of doors; the Wrought Barrel, Wrought Tower, Wrought Square and Wrought Shutter Bolts having Staples from  $\frac{1}{8}$  to  $\frac{1}{4}$  inch wider than the Bolt to allow for sagging of doors or an unequal settling of floors.

A correspondent in Philadelphia, who suggests methods by which Awls may be secured in the handles by means of a sleeve, or of a screw which enters or strikes against the shank, writes as follows in regard to the necessity for some such contrivance:

I send you a "suggestion for a stormy day." Will not some Hardware manufacturer turn out an Awl or Screw-Driver which will not be constantly coming out of the handle? The ordinary housekeeper spends more time in making the shank stick in the handle than in doing the job. The shank should be large, and the same size for two or three sizes of Awls.

A subscriber in Illinois, referring to the diversity of prices and price lists, writes as follows, calling on the manufacturers to give lists and catalogues of more uniform size:

I have read your correspondents' many plans for arranging stores with much interest, and would now make a suggestion to manufacturers which, if acted upon, would benefit retail dealers very much. Would it not be advisable to make price lists and catalogues of uniform size for our convenience? Why cannot the manufacturers, when meeting to agree upon uniform prices, also agree to make their price lists of uniform size? It would be an improvement on the present lists, which are issued in so many different sizes, necessitating their being kept in a drawer, while, if they were of uniform size, they could be put on a shelf kept specially for that purpose. This would obviate the trouble of going through a lot of paper when "rushed," and one would know just where to find any particular list.

After referring to the value of the articles on the arrangement of Hardware stores, another correspondent writes:

This subject naturally suggests another step in this line which could easily be brought about in this day of conventions and combinations among manufacturers and others, viz.: Let

the Stove men adopt a uniform size of catalogue; also Saw Mill and Wood-Working Machinery manufacturers; ditto Tools and Machinery; ditto Agricultural and Farm Machinery; also Pumps, Engines, &c. This would make it easy and convenient for dealers to preserve their catalogues and save themselves the trouble of answering so many letters of inquiry.

And now, while I am writing about improvements in this line, I beg to call your attention to another thing, which, if heeded

The shelves are made of three pieces of scantling, each 2 x 4 inches. Stove-Pipe sizes are set up against the wall. This Rack is referred to as answering its purpose admirably where the stock consists of two or three bundles of each size, it thus being adapted to the requirements of most of the retail trade. Where a heavier stock is kept, consisting of 1 or 2 tons, a larger Rack would obviously be required.

to as being that the customer can make his selection with very little handling, as he sees the price before him, and it is stated that in nineteen cases out of twenty the customer will take the sample, which permits the assortment being kept fresh and clean. If, however, a sample becomes rusted from handling, it is disposed of at a reduced price. The tag or slip is never reversed until the number of Knife is exhausted, an arrangement which is referred to by our correspondents as having the advantage of preventing them from losing sight of any number Pocket Knife so long as it is contained in stock. The slip is then destroyed. The point is also made that on the slip there is room for remarks, such as "Remnant," "Last one," "Hard stock," "Push off," &c., written small in pencil. When a particular number becomes unsaleable a red slip is used, emblematic of the auctioneer's flag, which indicates that the clerk must use especial efforts to sell that number. This system is said to become more satisfactory the longer it is used.

From A. L. Young, Sing Sing, N. Y., we have the following communication referring to the description of the store of C. P. Sherwood, White Plains, N. Y., as given in our recent issue. Suggestions are made, it will be observed, with refer-

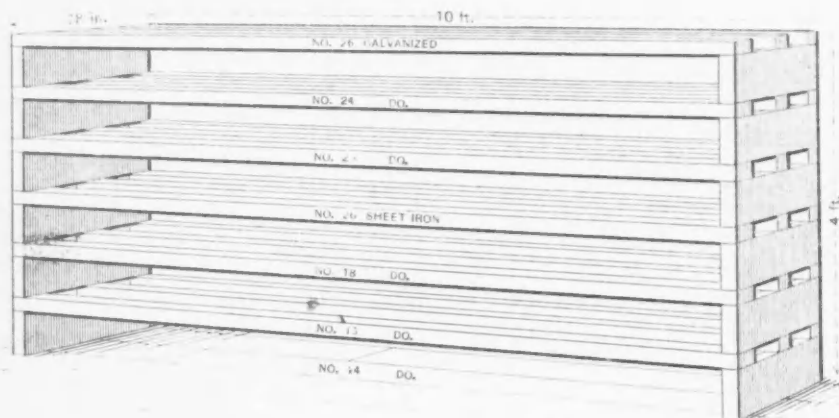


Fig. 181.—Sheet-Iron Rack.

by manufacturers of Shelf Hardware, would add greatly to the comfort and happiness of the retail dealer, as well as the general appearance of his stock. Let them invariably use green boxes, or at least good paper boxes with green labels, for all goods intended to be placed on the shelves, except, perhaps, Repair Links, Hasps and Staples and similar iron goods, which look better in black boxes with green labels. Of course there are a few exceptions to this fixed and hard rule that will naturally suggest themselves, but I am sorry to see the tendency lately is toward cheaper shelf boxes instead of better-looking ones.

#### HARDWARE EXPORTS.

It is gratifying to observe that the exports of American Hardware gain in volume from year to year. Cutlery also forms a growing item. The tabulated returns of exports received weekly from the Custom House afford the best of evidence that American goods are becoming more highly appreciated, not only in South America, Central America and the West Indies, but quite as noticeably in Europe. During the last week, for example, London, Liverpool, Hull and Hamburg appear among the buyers. Mexico and Uruguay are also good customers. The last-named in the list, however, is Japan, who takes 114 packages for the week, valued at \$3695. The shipments to other foreign ports in several instances have a valuation of about \$2000. Thirteen countries together take Hardware to the value of about \$23,000, and including Cutlery the total must be in the neighborhood of \$25,000, or at the rate of \$100,000 per month or \$1,200,000 per annum. But the trade is yet in its infancy, metal goods of American manufacture being unrivaled in point of adaptability and application to varied uses, while the inventive faculty here finds a field without limit, and in regard to excellence of workmanship American goods are gaining a well deserved reputation.

#### ARRANGEMENT OF HARDWARE STORES.

Sprague Bros., Greenville, Mich., contribute a description of the Iron Rack, which is illustrated in the engraving, Fig. 181. This Rack is 10 feet long, 4 feet high and 28 inches deep. Its construction is indicated in the illustration, the end of the Rack being made of 2-inch stuff, the space between the shelves on which the Iron rests being 6 inches, the sheets being inserted edgewise in their proper places.

We are indebted to the same house, of whose store, it will be remembered, we gave a description early in the present series of articles, for a description of their Glass Rack, which is shown in Fig. 182. This Rack is 28 inches deep, 3 feet wide and 7 feet high. It is placed in a corner, so that, if glass projects, it is not in the way. All long glass, 10 inches wide, is placed endwise in the 10-inch spaces, and all other widths are similarly treated. With this arrangement, when it is desired to obtain glass of any given size, it is only necessary with the glass rule to measure the length. The glass table stands in front of this Rack and is 30 x 60 inches.

Their method of suspending goods from the ceiling is also illustrated in Fig. 183, and is referred to as peculiarly adapted to their store, which is long and narrow, 124 x 20½ feet, and 15 feet high. On account of its height the goods are not in any case fastened directly to the ceiling, but the arrangement shown in Fig. 183 is adopted. Their description of the construction and use of this arrangement is as follows:

We take ¼-inch gas-pipe and fasten it to the ceiling joists by welding a ¾ lag screw to one end, the other end being fastened to ¾ pipe running lengthwise of the store, thus giving a hanging rack from which to suspend articles. We have one of these on each side of the store, and two more toward the middle and higher up, and in the middle of the store one more. When these supports are hung full of goods they give the store a kind of arched effect, while at the same time they display the goods very satisfactorily. On these rods we hang Bird Cages, Chamber Pails, Lanterns, Coal Scuttles, Creamery Pails, Covered Tin Pails, Well Buckets, and all kinds of Tinware that do not pack together. The height of these goods is such as not to interfere with a full view of the shelving. We have wire hooks fastened on the ¾ pipe, which are movable, so as to adjust the location of the different articles hung upon them.

The illustration Fig 184 represents a slip taken from the Pocket-Knife Showcase of J. Snow & Co., Tuscaloosa, Ala. They refer to having used the system to which it relates for many years with great satisfaction. A sample of the Pocket Knife to which it belongs is laid on the slip in such a way that it conceals the number, cost and price as given in characters, but exposes to the customer's eye the retail price in large figures. The Knives in the case are arranged in the order of price, beginning at 10 cents and running up to \$2. An advantage of this arrangement is referred



Fig. 182.—Sprague Brothers' Glass Rack.

ence to some modifications in the methods described, which are worthy the consideration of our readers:

Noticing your description of the admirable Hardware store of C. P. Sherwood, White Plains, N. Y., which is the best fitted store I have ever seen, I wish to call your attention to an improvement in the Iron Rack, namely, flooring the bins in the rack with ½-inch stuff, thereby not only holding the short pieces of rods so that they will not drop down into the bins below, but also preventing the ends of the long, thin Tire Iron and Rods from bending down below the cross-barring, and enabling a man to



put away the stock with more facility, while at the same time it is kept in better order.

Again, in relation to his Stove Board Rack: I have used one for years very like his, turned up on the large end, allowing the Stove Boards to rest on shelves 3 inches apart, the largest being placed at the bottom and the bins closed all around, except in front. The advantages of my plan I conceive to be in keeping the Boards in better shape, as they lie flat on the shelves, while standing them on edge will give them a tendency to curl up. At the same time the stock is protected from dust to a much greater extent.

*Management of Belting.*—We have an inquiry from a prominent house in the South in regard to a desirable arrangement

by the Tack manufacturers, January 2, 1888, in a form of a small pamphlet. It is neatly printed and conveniently arranged.

C. J. Swift & Co., Corry, Pa., announce that Earl Clark has taken the place of C. C. Bailey, who will represent them as traveling salesman on the road, Mr. Bailey being no longer in their employ.

The Chicago Spring Butt Company, Chicago, Ill., have issued their 1888 illustrated catalogue, which relates to their Chicago and Garden City Spring Butts of different patterns, Fire Engine House Spring Hinge, Door Springs, &c., and also

tivator has been improved since last year by a change in the manner of adjusting and holding the teeth, an improvement which is secured by patent. They direct special attention to their Superb Hoe, which is a triangular concave toothed Hoe for field and garden use. They have also added a Pruning Shears which is designated as the Sylvan, and has a patent guard hook, and the Eagle Trimming Knife, which is for cutting and clawing out berry canes, deadwood, &c. The list also illustrates their well-known line of Iron Age Cultivators and other Cultivators and Implements.

At a meeting of the Rate Committee of the Southern Railway and Steamship Association, held in Cincinnati, January 4, 5 and 6, certain matters of classification were considered and some changes made. We note below the following which will interest our readers:

	Class.
Hinges or Hooks in barrels or casks	5
Metallic Shingles in boxes	4
Valves, Metal, boxed	2
Valves, Metal, in kegs, barrels or casks	3
Tinware, boxed	2
Agate and Granite Ware, boxed	2
Agate and Granite Stamped Ware, boxed	3
Pipe Fittings, Iron, wired in bundles, L. C. L., Class 3; C. L. Special Iron Rate	
Pipe Fittings, Iron, in kegs, casks or barrels, any quantity, Special Iron Rate	
Cotton Rope, Clothes Line, Bed Cord and Rope N. O. S., L. C. L. Class 4; C. L. Class 6	
Iron Chains in casks or barrels, value limited to 2 cents per pound and so specified on bill of lading, Special Iron Rate.	

The trade will observe among the Special Notices, on page 45, one in which C. N. Edwards, formerly of Edwards & Marvin, advertises for a position as a Hardware salesman to represent a manufacturer or Hardware commission house. Mr. Edwards' experience in this line is alluded to, as well as his acquaintance with the trade throughout the South and Southwest.

The Ames Plow Company, 53 Beekman street, New York, issue a circular devoted to the Little Giant Wheel Jacks, of which an illustration is given, and also one showing the manner of its use. List prices are also given for the Jacks, both with plain notched heads, and with iron-plated notched heads.

The trade will observe the advertisement of the Clark Mfg. Company, of Buffalo, N. Y., on page 78, in which they illus-

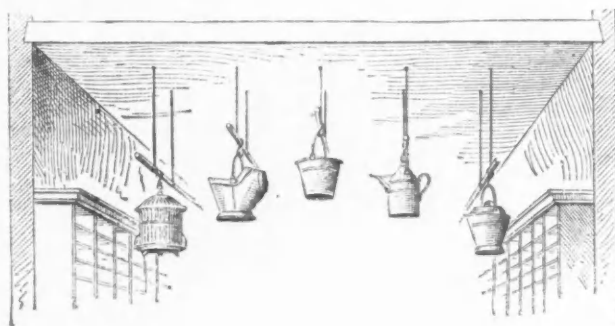


Fig. 183.—Method of Suspending Articles from Ceiling.

for Belting, both Leather and Rubber. We shall be glad if some of the trade who have convenient racks for this purpose, or have other methods which they regard as satisfactory, will give information on this point, concerning which our correspondents have said thus far comparatively little.

#### ITEMS.

Withington & Cooley Mfg. Company, Jackson, Mich., have issued their 1888 catalogue in their usual attractive style. It is devoted to Hoes, Steel Rakes, Forks, Wood Goods, Wheelbarrows, &c.

Janney, Semple & Co., Minneapolis, Minn., announce that on the 1st inst. Horace M. Hill, who for many years has been in their employ, was admitted a member of their firm, the name of which remains unchanged.

The Rhode Island Horse Shoe Company, Providence, R. I., announce that their mills and machinery are now in complete order, having been thoroughly rebuilt and

Nickel-Plated House Numbers and Letters, Genuine Bronze Push Plates and Bronze Metal Sliding Door Lock. It is to be observed that they have changed the numbers, so that those ordering the goods will do well to consult the new catalogue. The company explain their method of labeling so as to designate the different finishes of the goods.

Olin Scott, Bennington, Vt., issues a price list of Measuring Rods of his manufacture, in which, without illustrations, descriptions are given of the different sizes and patterns of these goods. Among these is a Circumference Scale, of which the following description is furnished us:

On this Scale the actual length of the circumference is marked with graduations for feet, inches and the ordinary subdivisions of an inch—i. e., the unit of the Scale is 3.1416 feet long, equal to the circumference of a circle 1 foot diameter. This unit is subdivided into 12 parts, each corresponding to the circumference of an inch, and these again into halves, quarters and eighths, so that to lay off a circumference of known diameter you have

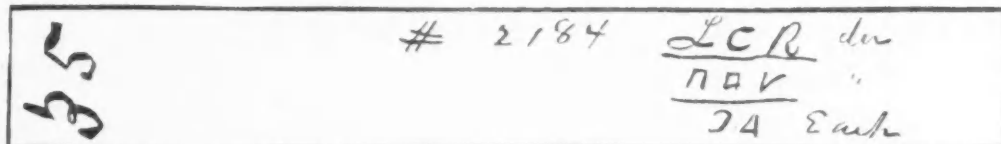


Fig. 184.—Pocket Knife Selling Card.

repaired since their total destruction by fire one year ago. During the past year they state that they have been obliged to decline orders, and have been unavoidably slow in the delivery of those they accepted, but it is their intention to run their works to their full capacity during the winter, so that they may have a stock of Shoes, which will enable them when trade opens to execute orders with their former promptness.

The Chisholm Steel Shovel Works, Cleveland, Ohio have issued No. 7 illustrated price list, bearing date 1888. It is in the same style as their last, and contains some additions, among which they call attention to those illustrated on pages 20 and 32. Their new low-priced Shovels and Spades, Thistle, shown on page 14, are also specially referred to.

The Chicago Tack Co., Grand Crossing, Ill., have issued the Hardware list adopted

only to take the reading on the rod corresponding to feet and fractions of feet contained in the diameter, and such reading is the actual length without reference to feet or inches. If the same circumference is wanted in feet and fractions of feet or inches, it is shown by the graduated scale of feet and inches on the adjacent side of the rod, so that both scales may be seen at a glance.

This line of goods Mr. Scott has been making for more than 30 years, and his list relating to it will be of great interest.

E. S. & F. Bateman, Spring Mills, N. J., have issued their catalogue for the present year. It is enlarged by the addition of some new goods, among which may be mentioned their New Model Seed Drills, Jewel Wheel Hoes and Superb Hoes. Their New Model Drills are referred to as having sustained in actual use the claims which were made for them in advance, and the manufacturers advise us that they have already secured large orders for the second season. Their Combined Harrow and Cul-

trate their Clark's Blind Hinges; and attention is called to the fact that they are prepared to furnish the Genuine Clark's Blind Hinges in any quantity, and are still the headquarters for these goods.

The Kingery Mfg. Company, 9 West Pearl street, Cincinnati, Ohio, issue a circular devoted to their Economy Ice Cream Freezer, which is referred to as a new article.

Under date December 31 the Peck, Stow & Wilcox Company, 27 Chambers street, New York, and Southington, Conn., send out the following circular which is addressed to their customers who purchase goods through syndicate buyers in New York:

To avoid all misunderstandings and causes for disagreement on such purchases, we have decided as follows: The prices, terms and conditions made by such buyers will be plainly noted on each invoice. Each

bill will be stamped P. A. T. O. P.—viz.: "Price agreed on at time of purchase,"—and will be subject to no further discounts whatsoever. No guarantee whatsoever will be allowed on any goods purchased through syndicate buyers. These terms and prices will be entirely independent of any arrangements we have made with you in person, or through our authorized agents.

H. A. Taylor, manager of the Chicago branch of the American Screw Company, issued a very neat New Year's greeting to his customers, in which, alluding to other matters, he refers to their quarters at 19 Lake street as having been greatly enlarged, and their facilities for filling orders made better than ever.

Our readers will be attracted by the advertisement on page 51, in which J. B. Field & Co., Detroit, Mich., call attention to their sporting goods. The illustration, which is the representation of a genuine hunter and sportsman, is the product of J. B. Field's pencil, who is said to be especially proficient in the knowledge of a proper sporting outfit, and whose familiarity with the craft is so pleasantly shown in the spirited sketch.

S. A. Munger & Co., Detroit, Mich., announce that John Freeman, for many years with the wholesale Hardware house of George Worthington & Co., Cleveland, Ohio, and latterly with Buhl, Sons & Co., Detroit, has been admitted as a partner in their firm. Mr. Freeman is referred to as well and favorably known to a great portion of the Hardwaremen of Michigan, Wisconsin, Minnesota and Dakota, and assisted by his experience and ability the firm express the hope that they will further increase what has already been a satisfactory business. They also refer to their stock of Hardware, and their endeavor to fill all orders completely and promptly. In connection with this announcement they state that there is now being erected for them on Woodward avenue, near the river, a very fine Hardware store which, together with the large warehouse in the rear and the ample dock frontage on the river, will give them exceptional facilities for the handling and shipping of their goods.

The special notice on page 176 in which Haydock & Bissell announce an important sale of Cutlery, Plated Ware, &c., will be observed by our readers. This sale, of which particulars are given, takes place, it will be seen, on February 8 and 9 at their salesroom, 12 Murray street and 15 Park place.

The advertisement of the Edward Storm Spring Company, Poughkeepsie, N. Y., for whom John H. Graham & Co., 113 Chambers street, New York, are agents, represents, it will be observed, an article which they refer to as largely sold in drug stores, and also to a considerable extent by Hardwaremen. The utility of the Combined Dose Indicator, Tumbler Cover and Spoon Holder there illustrated is obvious, and we doubt not that many Hardware merchants will find the article a saleable one.

Mr. L. M. Bates, formerly of 243 Arch street, Philadelphia, Pa., has now moved his stock of goods to new and commodious quarters at 321 Vine street, same city, and, in addition to his usual line of Windmills and Supplies, will represent the Goulds Mfg. Company, and carry a full stock of Pumps, Engines, Rams, Hydraulic Machinery and all classes of goods which they manufacture. He will be, in fact, their representative agent in that section, and they request that orders and communications shall be addressed to him.

The Kilmer Mfg. Company, Newburg, N. Y., and 543 and 545 State street, Chicago, manufacturers of Bale Ties and Wire and Fencing, have issued an ornamental calendar for this year. The card forming

the back of the calendar presents a handsome lithographic view of the company's works, together with portraits of each of the members of the company, which is composed of A. Kilmer, his seven sons and a son-in-law. In connection with the portraits appears the motto "A Head of All."

The announcement made on page 52 by Schoverling, Daly & Gales in regard to their purchase of the stock and good-will of the well-known house of John P. Moore's Sons, and the continuation of their business at 84 and 86 Chambers street and 302 Broadway, New York, will be of interest to the trade. It will be seen that reference is made to their large stock of Guns and Gun Goods, as well as the fact that special attention will be given to Fishing Tackle.

The John C. Jewett Mfg. Company, Buffalo, N. Y., send us one of their exceedingly neat and well-arranged illustrated catalogues of Refrigerators, Water Filters, Water Coolers and Bird Cages, which they manufacture. In presenting this thirty-ninth annual catalogue they ask the trade to look it over carefully, and note the large assortment of Refrigerators, Water Filters, Water Coolers, Bird Cages, Toilet Ware and other House-Furnishing Goods which they offer for inspection and purchase. It is unnecessary to enumerate the articles which are described and illustrated in this pamphlet. Suffice it to say that they comprise a full line of those already noticed, beside many other miscellaneous goods. A complete index classifying the goods under sections, and referring to the pages in which they appear, is printed in the early part of the pamphlet. Following it are nearly 200 pages of matter in which are described and illustrated the various articles enumerated in the index. Besides the description and illustrations, price lists are given in every case. The pamphlet is printed on a very good quality of paper, and is bound in an exceptionally tasteful manner, the cover having just sufficient gilt in its decoration to make it pleasing, without being gaudy in any way.

#### HARDWARE AT PITTSBURGH.

From a recent issue of the Pittsburgh *Dispatch* we take the following regarding the Hardware trade in the above-named city:

There are no exclusively wholesale jobbing houses in Hardware in Pittsburgh. Five firms in the city, however, do a large jobbing business, which in the order of age are as follows: Logan, Gregg & Co., 306 Wood street, established in 1831 by Logan & Kennedy; Wolff, Lane & Co., 304 Wood street, in 1836, by Whitmore & Wolff; Joseph Woodwell & Co., 200 Wood street, by Joseph Woodwell, in 1847; the Bindley Hardware Company, 46 Seventh avenue, established in 1853, by John England, and Lindsay, Sterritt & Co., 247 Liberty street, established in 1867. In Allegheny, Joseph Lantner & Co., 214 Ohio street, do an extensive jobbing business in Hardware, and were established in 1858. All these concerns have a retail department in which a light business is done, but jobbing is the main feature of their business. The year just closed has been Pittsburgh's best year in the jobbing and commission Hardware business. One of the heaviest firms reports an increase of 25 per cent. over 1886, and 20 per cent. of an advance in 1886 over 1885. The aggregate jobbing and commission sales of Hardware in this city for 1887 will exceed \$2,500,000, an amount which is fully double the trade of five years ago. In the Hardware industry Philadelphia and Cleveland are Pittsburgh's principal competitors. Cincinnati has been easily distanced by this city in this department in the last two or three years. There is no jobbing Hardware house in Cincinnati which does the business of Pittsburgh's leading Hardware house. Cleveland and Pittsburgh are at this date about neck and neck in the race for supremacy among the interior cities of the United States. But if the growth of the past two years continues Cleveland will soon be left behind, as Cincinnati has already been. In the line of heavy Hardware Pittsburgh is now the recognized center of the trade in the United States. For what are known in the trade as shelf goods this city

has advantages equal to any other point in the matter of shipping, and in heavy Hardware its advantages are superior to any other city of the interior. In these heavier goods, and particularly in Builders' Supplies, this city is the great manufacturing center, and home jobbers find their goods in this line close to their doors. The bulk of the heavy Hardware is a home product. The light articles in this industry come chiefly from New England.

The Hardware trade in this and other American cities has been almost entirely revolutionized in the past quarter of a century as regards importations from Europe. When the veteran Pittsburgh Hardware merchant, Joseph Woodwell, entered upon this industry, 40 years ago, nearly all the finer grades of Hardware came from across the seas. This importation has been steadily diminishing year by year until now a very small fraction of the Hardware comes from Europe, and the time is not far distant when this trade will be monopolized by the home-made article. Even now Hardware of American manufacture is on sale at Sheffield, England's center of this industry, and in London the Hardware houses carry almost as much American as English stock. The Pittsburgh Hardware jobbing houses have a trade that reaches into Illinois on the West, and the present year will see the lines of one house extended beyond the Mississippi. It was not many years ago when Cincinnati led this city in the jobbing Hardware trade. Now the traveling agents of Pittsburgh firms are pushing their trade around and beyond the Queen City, and the order books of this city's dealers will show extensive deals in this line in Southwestern Ohio, Southern Indiana and Northern Kentucky—fields which Cincinnati has hitherto claimed as belonging to its own business bailiwick. In East Pennsylvania Pittsburgh is contesting with Philadelphia, her strongest Hardware competitor, for territory in the Juniata Valley, and is now sending ware to points beyond Huntingdon. Among the Hardware features in which Pittsburgh leads are Contractors' Supplies—particularly railroad contractors—who look upon this city as a center in this line. As a market for Sledges, Hammers, Wedges, Crowbars, Picks and Mattocks this city can defy competition. The great bulk of these goods handled by Pittsburgh jobbers is manufactured at home. The Iron City Tool Company, the firm of Klein & Logan, tool manufacturers, Southside, and William Harmon & Son, Chancery lane, not only furnish to Pittsburgh jobbers, builders and contractors tools, but also supply jobbers in other cities in the same line with the bulk of their stock.

In the line of Locks, Hinges, Hatchets and Light Hardware generally the Pittsburgh firms of Nimick & Brittan, whose works are at Lockton, on the Panhandle Railroad; S. Jarvis, Adams & Co., Twelfth street, and the Enterprise Hardware Company, of Allegheny, furnish the bulk of the goods for the Pittsburgh jobbers. In the matter of Hardware Furnishments for the new court house, this city's dealers were brought into very close competition with dealers from other cities. The bidders were at hand from all parts of the East to secure this contract. When the bids were opened it was found that a home firm had carried off the prize. This city is the center for the Coil Chain industry. The Iron City Chain Works and the firm of Reiter & Co. are the chief manufacturers in this line. This city is also the recognized center of the industry for everything in Iron and Steel pertaining to blacksmith and wagon-makers' materials. The firm of Oliver Brothers & Phillips are able at any time to furnish the Iron and Steel material for 1000 wagons. In addition to the Hardware jobbers already named are a number of Pittsburgh firms which deal exclusively in Saddlery and Carriage Hardware: Thomas Hare & Co., 513 Wood street; W. Nease & Co., 1023 Liberty street; McWhinney & Co., 927 Liberty, and Lyle & McCance, 622 Liberty, deal exclusively in this line of the Hardware trade, and are doing a business which exceeds the half million annually. It is evident from the foregoing that this city is not likely to let go its hold on the great Hardware industry, which is in the line of its specialties. Pittsburgh's right to this field has been disputed many years by neighboring cities. There now remains but one competitor worthy of her steel. Cleveland has an immense territory along the upper lakes, which furnishes an increasing demand for everything that pertains to the Hardware industry. But with all the advantages of the Forest City, Pittsburgh is on the gain, and is easily equal now in this traffic.

The smelting interests of Leadville are put in jeopardy by the discrimination of railroads in favor of Denver and Pueblo, the latter paying higher rates for transportation. The output of the Leadville works last year was valued at \$6,760,000. Lead alone comprised 27,016 tons.



# CURRENT HARDWARE PRICES.

JANUARY 25, 1888.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

## Ammunition.

Caps, Percussion, 1000—	
Black & Goldmark's	
F. L. Waterproof, 1-10's	50¢
E. B. Trimmed Edge, 1-10's	50¢
E. B. Ground Edge, Central Fire, 1-10's	70¢
Double Waterproof, 1-10's	1.40
Musket Waterproof, 1-10's	52¢
G. D.	28¢
E. B.	30¢
Union Metallic Cartridge Co.	
F. C. Trimmed	50¢
F. L. Ground	50¢
Cent. Fire Ground	70¢
Double Waterproof	1.40
Double Waterproof, in 1-10's	1.40
E. B. Genuine Imported	45¢
Eley's E. B.	54¢
Eley's D Waterproof, Central Fire	1.60

## Cartridges.

Rim Fire Cartridges	dis 50&52
Rim Fire Military Cartridges	dis 15&2
Cent. Fire Cartridges, Pistol and Rifle	dis 25&52
Cent. Fire Cartr., Military & Sporting	dis 15&52
Blank Cartridges, except 25 and 32 cal., an additional 10% over above discounts.	
Blank Cartridges 22 cal.	1.75, dis 2
Blank Cartridges 32 cal.	3.50, dis 2
Primed Shells and Bullets	dis 11&52
B. B. Caps, Round Ball	1.75, dis 2
B. B. Caps, Conical Ball, Swaged	2.00, dis 2

## Primers.

Berdan Primers all sizes, and B. L. Caps (for Sturtevant Shells)	1.00, dis 2
All other Primers, all sizes	1.20, dis 2

## Shells.

First quality, 4, 8, 10 and 12 gauge	dis 25&10&2
First quality, 14, 16 and 20 gauge (#10 list)	dis 20&10&2
Star, Club, Rival and 10 gauge, 89 list	dis 23&10
Climax Brands, 12 gauge, 88 list	2
Club, Rival and Climax Brands, 14, 16 and 20 gauge	dis 30&10&2
Seibold's Combination Shot Shells	dis 15&2
Brass Shot Shells, 1st quality	dis 60&2
Brass Shot Shells, Club, Rival & Climax	dis 65&2

## Shells Loaded.

List No. 19, 1887	dis 20 to 10
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## Wads.

U. M. C. & W. R. A.—B. E., 11 up	2.00
U. M. C. & W. R. A.—B. E., 9&10	2.30
U. M. C. & W. R. A.—P. E., 7&8	2.30
U. M. C. & W. R. A.—P. E., 11 up	3.10
U. M. C. & W. R. A.—P. E., 9&10	4.00
U. M. C. & W. R. A.—P. E., 7&8	4.90
Eley's B. E., 11 up	1.75
Eley's P. E., 11 up	2.80

## Anvils.

Wright's—Eagle Anvils	dis 20 to 20&5
Wright's—Horse Hole	95¢
Armstrong's Mouse Hole, Extra	1.40
Trenton	95¢
Wilkinson	95¢
J. & Riley Carr. Patent Solid	1.10
Swiss Vice and Drill	
Millers Falls Co.	18.00, dis 20
Cheney Anvil and Vice	dis 25
Allen Combined Anvil and Vice	85
Moore & Barnes Mfg. Co.	dis 33&2

## Augers and Bits.

Douglas Mfg. Co.	
New Haven Copper Co.	
Wm. A. Ives & Co.	dis 70 to 70&5
Humphreysville Mfg. Co.	
French, Swift & Co. (F. H. Beecher)	
Connecticut Valley Mfg. Co.	
Cook's, Douglas Mfg. Co.	dis 55
Cook's, New Haven Copper Co.	dis 50&10&5
Free's Circular Lip	dis 60
Patent Solid Head	dis 30
C. E. Jennings & Co., No. 10, extension l.p.	dis 40
C. E. Jennings & Co., No. 30	dis 60
C. E. Jennings & Co., Auger Bits, in fancy boxes	
Lewis' Patent Single Twist	dis 20
Russell Jennings' Augers and Bits	dis 25
Imitation Jennings' Bits, new list	dis 60&6
Pugh's Black	dis 20
Car Bits	dis 50&10&5
L'Hommedieu Car Bits	dis 15&10
Forstner Pat. Auger Bits	dis 10
Hollow Augers	
Ives	dis 25&10
French, Swift & Co.	dis 25&10&5
Douglas	dis 40
Bonney's Adjustable	dis 40
Stearns	dis 20&10
Arves' Expansive, each \$4.50	dis 50&10
Universal Expansive, each \$4.50	dis 20
Wood's	dis 25

## Expansive Bits.

Clark's small, 18; large, 20	dis 35 to 35&5
Ives' No. 4, per doz.	dis 35 to 40
Swan's	dis 40
Stearns, No. 1, 20; No. 2, 22	dis 35
Stearns, No. 2, 24	dis 20
Common	gross \$2.75 to \$3.25
Diamond	gross \$1.10, dis 25&10
"Bee"	dis 25 to 25&5
Double Cut, Shepardson's	dis 45 to 45&5
Double Cut, Ct. Valley Mfg. Co.	dis 30&10
Double Cut, Hartwell's, gro.	dis 45 to 45&5
Double Cut, Douglas	dis 40 to 40
Double Cut, Ives	dis 60 to 60&5

## Bit Stock Drills.

Morse Twist Drills	dis 50&10&5
Standard	dis 50&10&5
Cleveland	dis 50&10&5
Syracuse, for metal	dis 50&10&5
Syracuse, for wood (wood list)	dis 30 to 30&5
Williams' or Holt's, for metal	dis 50&10&5
Williams' or Holt's, for wood	dis 40&10

## Ship Augers and Bits.

L'Hommedieu's	dis 15 to 15
Watrous's	dis 15&10
Snell's	dis 15 to 15
Snell's Ship Auger Pattern Car Bits	dis 15&10
Awl Hafts	
Sewing, Brass Ferrule	33.50 gross—dis 45&10
Patent Sewing, Short	1.00 gross—dis 40&10
Patent Sewing, Long	1.20 gross—dis 45&10
Patent Peg, Plain Top	10.00 gross—dis 45&10
Patent Peg, Leather Top	12.00 gross—dis 45&10

## Awls, Brad Sets, &c.

Awls, Sewing, Common	gross \$1.70—dis 35
Awls, Shouldered Peg	gross \$2.45—dis 40&40&10
Awls, Patent Peg	gross \$3.60—dis 40&40&10
Awls, Shouldered Brad	gross \$2.70—dis 35
Awls, Handled Brad	gross \$7.50—dis 45
Awls, Handled Scratch	gross \$7.50—dis 35&10
Awls, Socket Scratch	gross \$1.50—dis 25 to 30

## Awl and Tool Sets.

Aiken's Sets, Awls & Tools, No. 20	gross \$10—dis 50&10
Fray's Ad Tool Hds., Nos. 1, 12; 2, 12; 3, 12; 4, 12	dis 25 to 25&10
Miller's Falls Adj. Tool Hds., Nos. 1, 12; 2, 12; 3, 12; 4, 12	dis 25 to 25&10
Henry's Combination Haft	gross \$2.00—dis 25
Brad Sets, No. 42, 10.50, No. 43, 12.50	dis 70&10&5
Brad Sets, Stanley's Excelsior, No. 1, 7.50	dis 30 to 30
Brad Sets, Stanley's Excelsior, No. 2, 14.00	dis 30 to 30
Brad Sets, Stanley's Excelsior, No. 3, 25.50	dis 30 to 30

## Axes.

Makers' and Special Brands—	
First quality	gross \$0.50 to \$0.75
Others	gross \$0.75 to \$0.80

## Axle Grease.

Fraser's, in bulk	gross \$0.50 to \$0.75
Fraser's, in boxes	gross \$0.50 to \$0.75
Dixon's Everlasting, in boxes	gross \$1.20 to \$1.30
Dixon's Everlasting, 10-lb pails, each	85¢
Lower grades, special brands	gross \$0.50 to \$0.75

## Axles.

No. 1, 4 to 4 1/2; No. 2, 5 to 5 1/2; No. 3, 6 to 6 1/2; No. 4, 7 to 7 1/2	dis 50 to 50&10
Nos. 19 to 22	dis 60 to 60&10 to 60&10&5
National Wrought Steel Tubular Self-Opening	
Standard Farm (1 to 5) and Special Farm (A1 to A5)	dis 35 to 35
Less than 10 sets	dis 35 to 35
Over 10 sets	dis 35 to 35
X Strong Extra (6 to 9), & XX Strong Truck (10 to 10)	dis 40 to 40
Less than 10 sets	dis 40 to 40
Over 10 sets	dis 40 to 40

## Bag Holders.

Spring's Pat., 1/2 doz \$18	dis 60
Balances—Spring Balances	dis 50
Common 24 lb	dis 50
Challinor's Spring Balances	dis 50
Challinor's Circular Spring Balances	dis 60

## Bells.

Light Brass	dis 70 to 70
Extra Heavy	dis 60 to 60
White Metal	dis 50 to 50
Silver Chimney	dis 25 to 25
Globe (Cone's Patent)	dis 25 to 25
Gong, Abbe's	dis 25 to 25
Gong, Yankee	dis 40 to 40
Gong, Barton's	dis 40 to 40
Crank, Taylor's	dis 50 to 50
Crank, Brooks	dis 50 to 50
Crank, Cone's	dis 10 to 10
Crank, Cone's	dis 20 to 20
Lever, Sargent's	dis 60 to 60
Lever, Taylor's	dis 25 to 25
Lever, R. E. & Co.'s	dis 50 to 50
Full, Brooks	dis 50 to 50
Full, Western	dis 25 to 25

## Common Wrought.

Western	dis 20&10
Western, Sargent's list	dis 70&10
Kentucky "Star"	dis 70&10
Kentucky, Sargent's list	dis 70&10
Dodge, Genuine Kentucky, new list	dis 70&10
Texas Star	dis 50&10 to 50&10&5
Call	dis 40 to 40&5
Farm Bells	dis 24 to 24
Steel Alloy Church and School Bells	dis 40 to 40
Bellows—diachamitza	dis 50&10 to 50&10&5
Molders	dis 50 to 50
Band Rollers	dis 50 to 50

## Belting, Rubber.

Common standard	dis 75
Standard	dis 70&5
Extra	dis 60&10
N. Y. B. & P. Co. Standard	dis 60&5
N. Y. B. & P. Co. Extra Standard	dis 50&10&5

## Bench Stops.

Hotchkiss's	gross \$9—dis 50
Weston's, per doz No. 1, \$10; No. 2, \$9	dis 25 to 25&5
McGill's	gross \$3—dis 10

## Bits.

Augers and Bits	
Extension, Barber's	dis 15.00—dis 40 to 40&10
Extension, Ives	dis 20.00—dis 60&5 to 60&10
Diagonal	dis 24.00—dis 40
Angular	dis 24.00—dis 40&5

## Blind Adjusters.

Domestic	per doz \$3.00—dis 30
Excelsior	per doz \$10.00—dis 50&10&2
Washburn's Self-Locking	dis 20 to 20&10

## Blind Fasteners.

Blackell's	gross \$1.00—dis 20 to 20&10
Van Sand's Screw Pattern	dis 60&10
Van Sand's Old Pattern	dis 55 to 55
Washburn's Old Pattern	dis 50 to 50
Merriman's	dis 50 to 50
Austin & Eddy No. 1000	dis 30 to 30
Security Gravity	dis 30 to 30

## Blind Staples.

Barbed, 1/4 in. and larger	dis 8 to 8
Barbed, 1/2 in.	dis 9 to 9

## Blocks.

Ordinary Table, list April 17, '85	dis 40
Cleveland Block Co., Mal. Iron	dis 50

## Boles.

Cast Iron Barrel, Square, &c.	dis 70 to 70&10
Cast Iron Shutter Bolts	dis 70 to 70&10
Cast Iron Chain (Sargent's list)	dis 65 to 65
Ives' Patent Door Bolts	dis 55
Wrought Barrel	dis 70 to 70&10
Wrought Square	dis 70 to 70&10
Wrt Shutter, all Iron, Stanley's list	dis 60 to 60
Wrt Shutter, Brass Knob, Stanley's	dis 40 to 40
Wrought Shutter, Sargent's list	dis 60 to 60
Wrought Sunk Flush, Sargent's list	dis 55 to 55
Wrought Sunk Flush, Stanley's list	dis 40 to 40
Wrought B. K. Flush, Com'n Stanley's list	dis 55 to 55

## Door and Shutter.

Cast Iron Barrel, Square, &c.	dis 70 to 70&10
Cast Iron Shutter Bolts	dis 70 to 70&10
Cast Iron Chain (Sargent's list)	dis 65 to 65
Ives' Patent Door Bolts	dis 55
Wrought Barrel	dis 70 to 70&10
Wrought Square	dis 70 to 70&10
Wrt Shutter, all Iron, Stanley's list	dis 60 to 60
Wrt Shutter, Brass Knob, Stanley's	dis 40 to 40
Wrought Shutter, Sargent's list	dis 60 to 60
Wrought Sunk Flush, Sargent's list	dis 55 to 55
Wrought Sunk Flush, Stanley's list	dis 40 to 40
Wrought B. K. Flush, Com'n Stanley's list	dis 55 to 55

## Carriage.

Com. list June 10, '84	dis 70 to 70&5
Genuine Eagle, list Oct. '84	dis 75 to 75&5
Phila. pattern, list Oct. 7, '84	dis 75 to 75&10
R. B. & W. old list	dis 70

## Tires.

Common, list Feb. 28, 1883	dis 65 to 65
P. C. B. & N. Co., Empire, list Feb. 28, 1883	dis 65 to 65
P. C. B. & N. Co., Philadel., list Oct. '84	dis 82 to 82
P. C. B. & N. Co., Keystone, Phil. list Oct. '84	dis 80
P. C. B. & N. Co., Norway, Phil. list Oct. '84	dis 75 to 75
Am. S. Co., Norway, Phil. list Oct. '84	dis 75 to 75
Am. S. Co., Eagle, Phil. list Oct. '84	dis 80
Am. S. Co., Philadel., list Oct. 16, '84	dis 82 to 82
Am. S. Co., Bay State, list Feb. 28, '84	dis 65 to 65
R. B. & W., Philadel., list Oct. 16, 1884	dis 82
R. E. Mfg. Co., Skove	dis 65

## Stove and Plow.

Stove	dis 62 to 62
Plow	dis 60 to 60
Am. S. Co. Stove, Annealed	dis 62 to 62
R. B. & W., Plow	dis 65
R. E. Mfg. Co., Skove	dis 62 to 62
Machine	dis 75 to 75&5
Bolt Ends	dis 75 to 75&5

## Borax.

Without Augers	dis 95 to 95
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## Boring Machines.

Douglas	dis 50
Snell's, Rice's Patent	dis 40 to 40&10
Jennings	dis 45 to 45&10
Other Machines	dis 2.35
Phillips' Pat., with Augers 7.00	dis 7.50

## Sew Pins.

Humason, Beckley & Co.'s, Nos. 1 and 2	dis 60 to 60
Humason, Beckley & Co.'s other Nos.	dis 70 to 70&10
Sargent & Co.'s	dis 17 and 18, dis 60 to 60
Peck, Stow & W. Co.	dis 60 to 60

## Braces.

Backus, Nos. 110 to 114 and 31 to 33	dis 60 to 60 1/2
Backus, Nos. 6, 8, 12, 14	dis 60 to 60
Backus, Nos. 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100	dis 70 to 70 1/2
Barber's, Nos. 10 to 16	dis 50
Barber's, Nos. 30 to 33	dis 50
Barber's, Nos. 40 to 63	dis 50 to 50 1/2
Barber's, Nos. 8, 10 and 12	dis 50 to 50 1/2
Barker's, Plated, Nos. 8, 10 and 12	dis 65 to 10 1/2
Osgood & Ratchet	dis 40 to 10 1/2
Spofford's	dis 60 to 50
Ives' New Haven Novelty	dis 70 to 40 1/2
Ives' New Haven Ratchet	dis 60 to 50 1/2
Ives' Barber Ratchet	dis 60 to 50 1/2
Ives' Barbers	dis 60 to 50 1/2
Ives' Spofford	dis 60 to 50 1/2
Combs' American	dis 60 to 50 1/2
Bartholomew's, Nos. 25, 27, 30	dis 80 to 10 1/2
Bartholomew's, Nos. 117, 118, 119	dis 70 to 70 1/2
Amidon's Barker's Imp'd	dis 60 to 10 1/2
Amidon's Barker's	dis 70 to 70 1/2
Amidon's Eclipse	dis 70 to 70 1/2
Amidon's Globe Jaw	dis 40 to 40 1/2
Amidon's Corner Brace	dis 40 to 40 1/2
Amidon's Universal	8 in. \$1.30 10 in. \$2.10 12 in. \$3.00
F. S. & W. Buffalo Rail	dis 40 to 40 1/2





Best Anti-Friction.....	dis 60
Duplex (Wood Track).....	dis 60
Terry's Patent.....	dis 60
Cronk's Patent.....	dis 60
Wood Track, Iron Clad.....	dis 60
Archives.....	dis 60
Richards.....	dis 60
Lane's Steel Anti-Friction.....	dis 60
The Ball Bearing Door Hanger.....	dis 60
Warner's Patent.....	dis 60
Stearns' Anti-Friction.....	dis 60
Stearns' Challenge.....	dis 60
Pauline.....	dis 60
American.....	dis 60
Rider & Wooster, No. 1, 62 1/2; No. 2, 75.....	dis 60
Paragon, Nos. 1, 2 and 3.....	dis 60
Paragon, Nos. 4, 5, 6, 7 and 8.....	dis 60
Crescent.....	dis 60
Nickel, Cast Iron and Steel.....	dis 60
Nickel, Malleable Iron and Steel.....	dis 60

#### Harness Snaps.—See Snaps.

#### Hatchets.—List Jan. 1, 1888.

Isaiah Blood.....	dis 35
Hunt's Shingling Lath and Claw.....	dis 40
Hunt's Broad.....	dis 40
Buffalo Hammer Co.....	dis 40
Burd's.....	dis 40
Vorles & Plumb.....	dis 40
Wm. Mann, Jr., & Co.....	dis 40
Underhill Edge Tool Co.....	dis 40
Underhill's Haines and Bright goods.....	dis 40
C. Hammond & Son.....	dis 40
Stimons.....	dis 40
Peck's.....	dis 40
Kelly's.....	dis 40
Sargent & Co.....	dis 40
Ten Eyck Edge Tool Co.....	dis 40
Collins, following list.....	dis 40
Shingling, Nos. 1, 2, 3.....	dis 40
Claw, Nos. 1, 2, 3.....	dis 40
Lathing, Nos. 1, 2, 3.....	dis 40

#### Hay Knives.

Lightning.....	Mfrs. price \$40
Electric.....	dis 40
Gem.....	dis 40
Wadsworth's.....	dis 40
Carter's Needle.....	dis 40
Heath's.....	dis 40

#### Hinges.

Wrought Iron Hinges—	
Strap and T.....	dis 70
Screw Hook and (8, 10, 12 in.).....	dis 70
Strap.....	dis 70
Heavy Welded Hook.....	dis 70
Screw Hook and Eye.....	dis 70
Roller Blind Hinges, Nos. 32 and 34.....	dis 70
Roller Blind Hinges, Nos. 232 and 234.....	dis 70
Roller Blind.....	dis 70
Plate Hinges.....	dis 70
"Providence" over 12 in.....	dis 70
Spring Hinges—	
Geer's Spring and Blank Butts.....	dis 40
Union Spring Hinge Co.'s list, March, 1888.....	dis 40
Acme, Crown, Empire and U. S.....	dis 40
American, Gem, and Star, Japanned.....	dis 40
American, Gem, and Star, Bronzed.....	dis 40
Oxford, Bronze and Brass.....	dis 40
Barker's Double Acting.....	dis 40
Union Mfg. Co.....	dis 40
Bommer's.....	dis 40
Buckman's.....	dis 40
Chicago.....	dis 40
Gate Hinges—	
Western.....	dis 40
N. E. Reversible.....	dis 40
Clark's, Nos. 1, 2, 3, 4 and 5.....	dis 40
N. Y. State.....	dis 40
Automatic.....	dis 40
Common Sense.....	dis 40
Seymour's.....	dis 40
Shepard's, Nos. 1, 2, 3, 4 and 5.....	dis 40
Shepard's, Nos. 6, 7, 8, 9, 10 and 11.....	dis 40
Shepard's, Nos. 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.....	dis 40

#### Gate Hinges—

Western.....	dis 40
N. E. Reversible.....	dis 40
Clark's, Nos. 1, 2, 3, 4 and 5.....	dis 40
N. Y. State.....	dis 40
Automatic.....	dis 40
Common Sense.....	dis 40
Seymour's.....	dis 40
Shepard's, Nos. 1, 2, 3, 4 and 5.....	dis 40
Shepard's, Nos. 6, 7, 8, 9, 10 and 11.....	dis 40
Shepard's, Nos. 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.....	dis 40

#### Blind Hinges—

Parker.....	dis 75
Palmer.....	dis 75
Seymour.....	dis 75
Nicholson.....	dis 75
Clark's, Nos. 1, 2, 3, 4 and 5.....	dis 75
Clark's Mortise Gravity.....	dis 75
Sargent's, Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13.....	dis 75
Sargent's, No. 12.....	dis 75
Reading's Gravity.....	dis 75
Shepard's "Noiseless," Nos. 50, 60, 65 & 69.....	dis 75
Shepard's Niagara Gravity, Nos. 1, 2 and 3.....	dis 75
Shepard's Buffalo Gravity, Nos. 1, 2 and 3.....	dis 75
Shepard's Champion Gravity, No. 75.....	dis 75
Shepard's Steamboat Gravity, No. 10.....	dis 75
Shepard's Acme Lull & Porter.....	dis 75
Shepard's O. S. Lull & Porter.....	dis 75
Shepard's "Queen City" Reversible.....	dis 75
Clark's Lull & Porter, Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.....	dis 75
North's Automatic Blind Fixtures, No. 2, for Wood, \$10.50; No. 3, for Brick, \$13.50.....	dis 75

#### Rees.

Garden, Mortar, &c.....	dis 65
Planter's Cotton, &c.....	dis 65
Warren Hoe.....	dis 65
Magie.....	dis 65
D. & H. Scott.....	dis 15
Lane's Crescent Scovill Pattern.....	dis 45
Lane's Crescent Planter Pattern.....	dis 45
Lane's Razor Blade, Scovill Pattern.....	dis 45
Maynard.....	dis 45
Sandusky Tool Co.....	dis 60
Hubbard & Co.....	dis 60
Bare.....	dis 60
Grab.....	dis 60

#### Hoe Rings and Rings.

Hill's Improved Rings.....	dis 55
Hill's Old Style Rings.....	dis 55
Hill's Rings.....	dis 55
Perfect Rings.....	dis 55
Perfect Rings.....	dis 55
Blair's Hoe Rings.....	dis 55
Blair's Hoe Rings.....	dis 55

Champion Rings.....	dis 55
Champion Rings, Double.....	dis 55
Brown's Rings.....	dis 55
Brown's Rings.....	dis 55

#### Melting Apparatus.

"Moore's" Hand Hoist, with Lock Brake.....	dis 15
"Moore's" Differential Pulley Block.....	dis 20

#### Holders. Tool.

Balz Pat.....	dis 24
Balz Pat.....	dis 25

#### Hollow-Ware.

Stove Hollow-Ware, Ground.....	dis 60
Stove Hollow-Ware, Unground.....	dis 70
Kneaded and Tinned Hollow-Ware.....	dis 70
Kettles.....	dis 70
Oval Boilers, Saucepans & Gine Pots.....	dis 70
Grav Enamelled Ware.....	dis 70
Agate and Granite Ware.....	dis 70
Rustless Hollow-Ware.....	dis 70
Galvanized Tea-Kettles.....	dis 70
Each.....	dis 70

#### Silver Plated.

Reed & Barton.....	dis 40
Meriden Britannia Co.....	dis 40
Simpson, Hall, Miller & Co.....	dis 40
Rogers & Brother.....	dis 40
Hartford Silver Plate Co.....	dis 40
William Rogers Mfg. Co.....	dis 40

#### Hooks.

Cast Iron—	
Bird Case, Sargent's list.....	dis 40
Bird Case, Reading.....	dis 40
Clothes Line, Sargent's list.....	dis 40
Clothes Line, Reading list.....	dis 40
Celling, Sargent's list.....	dis 40
Harness, Reading list.....	dis 40
Coat and Hat, Sargent's list.....	dis 40
Coat and Hat, Reading.....	dis 40

#### Wrought Iron—

Cotton Pat. (N. Y. Mallet & Handle Works).....	dis 40
Tassel and Picture (T. & S. Mfg. Co.).....	dis 40
Wrought Staples, Hooks, &c.....	dis 40
Bench Hooks.....	dis 40

#### Wire—

Wire Coat and Hat, Gem, list April, 1888.....	dis 45
Wire Coat and Hat, Miles' list April, 1888.....	dis 45
Indestructible Coat and Hat.....	dis 45
Belts.....	dis 45
Grass.....	dis 45
Whitcomb Patent.....	dis 45
Hooks and Eyes—Malleable Iron.....	dis 45
Hooks and Eyes—Brass.....	dis 45
Fish Hooks, American.....	dis 45

#### Horse Nails.

Ansable.....	dis 25
Clinton, Fla.....	dis 25
Essex.....	dis 25
Putnam.....	dis 25
Vulcan.....	dis 25
Northwestern.....	dis 25
Grass.....	dis 25
A. C.....	dis 25
C. R. K.....	dis 25
Champlain.....	dis 25
New Haven.....	dis 25
Saranac.....	dis 25
Champion.....	dis 25
Capwell.....	dis 25
Star.....	dis 25

#### Horse Shoes.—See Shoes, Horse.

Hose, Rubber, competition.....	dis 75
Standard.....	dis 75
Extra.....	dis 75
N. Y. R. & P. Co., Extra.....	dis 75
N. Y. R. & P. Co., Extra.....	dis 75
N. Y. R. & P. Co., Dundee.....	dis 75

#### Ice Picks, Chisels, &c.

I Am, Ice Chisel Pol'd.....	dis 30
National Ice Chisel.....	dis 30
Nova's Ice Breakers.....	dis 30
Dunlap's Ring Picks.....	dis 30
Wood Head Picks, Sargent's.....	dis 30
Iron Head Picks, Sargent's.....	dis 30
Ice Mallets, Pick in handle.....	dis 30
Ice Axes, Small Cast or Mall.....	dis 30
Combination Ice Tools.....	dis 30
Acme Ice Pick and Tongs.....	dis 30
Rogers' Lightning Ice Chisel.....	dis 30

#### Ice Tongs.

Champion, S. S. & Co.....	dis 40
Family.....	dis 40

#### Jack Screws.—See Screws.

Kettles.....	dis 25
Brass larger than 17 inches.....	dis 25
Enamelled and Tea Kettles.....	dis 25

#### Keys.

Lock Anso's list Dec. 30, 1888.....	dis 50
Eagle, Cabinet, Trunk and Padlock.....	dis 50
Hotchkiss' Brass Blanks.....	dis 50
Hotchkiss' Copper and Tinned.....	dis 50
Hotchkiss' Padlock and Cabinet.....	dis 50
Ratchet Bed Keys.....	dis 50

#### Katie Sharpeners.

Parkin's Appewood Handles.....	dis 40
Parkin's Rosewood or Cocobolo.....	dis 40

#### Knives.

Wilson's Putter Knives.....	dis 25
Ames' Butcher Knives.....	dis 25
Nichols' Butcher Knives.....	dis 25
Ames' Shoe Knives.....	dis 25
Ames' Bread Knives.....	dis 25
Moran's Shoe and Bread Knives.....	dis 25
Hay and Pocket.....	dis 25

#### Knobs.

Door Mineral.....	dis 70
Door Por. Jap'd.....	dis 70
Door Por. Por. Nickel.....	dis 70
Door Por. Por. Nickel.....	dis 70
Drawer, Sargent's.....	dis 70
Benjamin's Door Knob, new list.....	dis 70
Yale & Towne Wood Knobs, list Dec. 1885.....	dis 70
Furniture Plain.....	dis 70
Furniture, Wood Screws.....	dis 70
Base, Rubber Tip.....	dis 70
Pierce, Jap'd.....	dis 70
Picture, Sargent's.....	dis 70
Picture, Hematite.....	dis 70
Shutter, Porcelain.....	dis 70
Carriage, Japanned.....	dis 70

#### Ladies.

Melting, Sargent's.....	dis 60
Melting, Reading.....	dis 60
Melting, Monroe's Patent.....	dis 60
Melting, P. S. & W.....	dis 60
Melting, Warner's.....	dis 60

#### Lanterns.

Tubular, No. 9, without Guards.....	dis 55
Tubular, Liftwire, No. 0, without Guards.....	dis 55
Tubular, Hinge Tip No. 0, without Guards.....	dis 55
Tubular, Bottom Lift, without Guards.....	dis 55
Tubular, U. S. Safety Lift Wire, no Guards.....	dis 55
Guards for Tubulars, add.....	dis 55
Police, Small, \$6.00; Med. \$7.25; Large, \$9.75.....	dis 55
Porter's Tin & R.....	dis 55

#### Lemon Squeezers.

Porcelain Lined, No. 1.....	dis 30
Wood, No. 2.....	dis 30
Wood, Common.....	dis 30
Dunlap's Improved.....	dis 30
Ames'.....	dis 30
Jennings' "Star".....	dis 30
The "Boss".....	dis 30
Dean's.....	dis 30
Little Giant.....	dis 30
King.....	dis 30

#### Lined.

Cotton and Linen Fish, Draper's.....	dis 50
Draper's Chalk.....	dis 50
Draper's Mason's Linen, 84 ft., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4, \$2.75; No. 5, \$3.25.....	dis 50
Cotton Chalk.....	dis 50
Samson, Cotton, No. 4, \$3; No. 4 1/2, \$3.50; No. 5, \$4.....	dis 50
Silver Lake, Braided, Nos. 0, \$5.00; No. 1, \$5.50; No. 2, \$6.00; No. 3, \$6.50; No. 4, \$7.00; No. 5, \$7.50.....	dis 50
Vascon's Linen, No. 3 1/2, \$1.50; No. 4, \$2; No. 5, \$2.50.....	dis 50
Vascon's Colored Cotton.....	dis 50
Wire Clothes, No. 18, \$3.75; No. 19, \$3.25; No. 20, \$2.75.....	dis 50
Ventilator Cord, "Amson Braided, White or Drab.....	dis 50
Cotton.....	dis 50

#### Locks, Padlocks, Cabinet Locks, &c.

Door Locks, Latches, &c.—	
List, Dec. 30, '88, chgd Feb. 2, '87.....	dis 50
Note.—Lower net prices often made.....	
Reading Hardware Co. (list Jan. 1, '88).....	dis 50
Livington & Co.....	dis 50
Perkins' Burglar Proof.....	dis 50
Perkins' "Extension Cylinder".....	dis 50
Barnes Mfg. Co.....	dis 50
Yale Corrugated Key.....	dis 50
Diets Flat Key.....	dis 50
L. & C. Round Key Latches.....	dis 50
L. & C. Flat Key Latches.....	dis 50
Romer's Night Latches.....	dis 50
Yale new list.....	dis 50
"Shepardson" or "U. S.".....	dis 50
"Felter" or "American".....	dis 50
Seed's N. Y. Hasp Lock.....	dis 50

#### Cabinets—

Eagle, Gaylord Parker and J. List March, '88, revised.....	dis 50
Corbin.....	dis 50
Deits, Nos. 30 to 39.....	dis 50
Deits, Nos. 40 to 49.....	dis 50
Deits, Nos. 50 to 59.....	dis 50
Stoddard Lock Co.....	dis 50
"Champion" Night Latches.....	dis 50
Barnes Mfg. Co.....	dis 50
Eagle and Corbin Trunk.....	dis 50
"Champion" Cabinet and Combination.....	dis 50
Yale.....	dis 50
Romer's.....	dis 50







# CURRENT METAL PRICES.

JANUARY 25, 1888.

## IRON AND STEEL.

### Bar Iron from Store.

Common Iron:	
1 to 2 in. round and square.	2.10 @ 2.20¢
2 to 4 in. x 1/2 to 1 in.	2.10 @ 2.20¢
Refined Iron:	
1 to 2 in. round and square.	2.35 @ 2.40¢
2 to 4 in. x 1/2 to 1 in.	2.35 @ 2.40¢
4 to 6 in. x 1/2 to 1 in.	2.45 @ 2.60¢
Rods—1/2 and 1-16 round and sq.	2.35 @ 2.50¢
Bands—1 to 6 x 3-16 to No. 12.	2.50 @ 2.80¢
"Hurdle's Best" Iron, base price	3.00 @ ...¢
Burton's "H. B. & S." Iron, base price.	2.80 @ ...¢
"Ulster"	3.10 @ ...¢
Norway Rods	4.00 @ 5.00¢

### Sheet Iron from Store.

	Common American.	R. G. Cleaned.
10 to 16.	2.75 @ 2.80¢	3.25 @ 3.50¢
17 to 20.	2.85 @ 3.00¢	3.25 @ 3.50¢
21 to 24.	3.00 @ 3.10¢	3.50 @ ...¢
25 and 26.	3.20 @ ...¢	3.75 @ ...¢
27.	3.75 @ 4.00¢	4.00 @ ...¢
28.	3.50 @ ...¢	4.00 @ ...¢

	B. B.	2d qual.
Galvanized, 14 to 20.	4.875¢	4.50¢
Galvanized, 21 to 24.	5.25¢	4.875¢
Galvanized, 25 to 28.	5.75¢	5.25¢
Galvanized, 27.	6.125¢	5.625¢
Galvanized, 28.	6.50¢	6.00¢
Patent Plashed.	8.00¢	8.00¢
Russia.	9.40¢ @ 10¢	9.40¢ @ 10¢
American Cold Rolled B. B.	5¢ @ 7¢	5¢ @ 7¢

**STEEL.**—Duty. Ingots, Bars, Sheets, &c., valued at 4¢ per lb. or less, 45¢ ad val.; valued above 4¢ and not above 7¢ per lb., 2¢ per lb.; valued above 7¢ and not above 10¢ per lb., 2½¢ per lb.; valued above 10¢ per lb., 3¼¢ per lb. *Extras*—Steel Bars, Rods, &c., cold hammered or polished in any way in addition to ordinary hot rolling, 1¼¢ per lb. in addition to above; Steel Circular Saw Plates, 1¢ per lb. in addition to the above.

### Chrome Steel.

Tool Steel, ordinary sizes 1/2 to 3 inches.	net.
Adamantine Shoes and Dies.	net.
Magnet Steel.	net.

### English Steel from Store.

Best Cast	15¢
Extra Cast	16½¢
Swaged, Cast.	16¢
Best Double Shear	15¢
Blister, 1st quality	12½¢
German Steel, Best.	10¢
2d quality.	9¢
8d quality.	8¢
Sheet Cast Steel, 1st quality.	15¢
2d quality.	14¢
8d quality.	12½¢

## METALS.

	Tin.	Per lb.
Banca, Pigs.	38¢	
Straits, Pigs.	38¢	
English, Pigs.	37½¢	
Straits in Bars.	39 @ 40¢	

### Tin Plates.

	Charcoal Plates.—Bright.	Per box of 50
Melny Grade.	IC, 10 x 14.	\$6.50
"	IC, 12 x 12.	6.70
"	IC, 14 x 20.	6.50
"	IC, 20 x 28.	13.00
"	IX, 10 x 14.	8.00
"	IX, 12 x 12.	8.20
"	IX, 14 x 20.	8.00
"	IX, 20 x 28.	16.00
"	DC, 12½ x 17.	6.00
"	DX, 12½ x 17.	7.50
Calland Grade.	IC, 10 x 14.	6.10
"	IC, 12 x 12.	6.20
"	IC, 14 x 20.	6.00
"	IX, 10 x 14.	7.50
"	IX, 12 x 12.	7.70
"	IX, 14 x 20.	7.50
Allaway Grade.	IC, 10 x 14.	\$5.25 @ 5.50
"	IC, 12 x 12.	5.50 @ 5.70
"	IC, 14 x 20.	5.25 @ 5.50
"	IC, 20 x 28.	10.75 @ 11.00
"	IX, 10 x 14.	6.50 @ 6.70
"	IX, 12 x 12.	6.75 @ 7.00
"	IX, 14 x 20.	6.50 @ 6.70
"	IX, 20 x 28.	12.75 @ 13.00
"	DC, 12½ x 17.	5.00 @ 5.20
"	DX, 12½ x 17.	6.00 @ 6.20

### Coke Plates.—Bright.

Steel Coke.—IC, 10 x 14, 14 x 20.....	\$5.50 @	\$5.10
10 x 20.....	7.50 @	8.00
20 x 28.....	10.00 @	10.25
IX, 10 x 14, 14 x 20.....		6.00
BV Grade.—IC, 10 x 14, 14 x 20.....		5.00

### Charcoal Plates.—Terns.

Dean Grade.—IC, 14 x 20.....	\$4.75
20 x 28.....	\$9.25 @ 9.50
IX, 14 x 20.....	5.75
20 x 28.....	11.50
Abecarne Grade.—IC, 14 x 20.....	\$4.50 @ 4.65
20 x 28.....	9.00 @ 9.25
IX, 14 x 20.....	5.50 @ 5.75
20 x 28.....	11.00

### Tin Boiler Plates.

	Per pound.
IX, 14 x 36.	112 sheets. 6¢
IX, 14 x 28.	112 sheets. 6¢
IX, 14 x 31.	112 sheets. 6¢

## Copper.

Duty: Pig. Bar and Ingot, 4¢; Old Copper, 8¢ per lb. Manufactured (including all articles of which Copper is a component of chief value), 45¢ ad valorem.

### Ingot.

Lake.	17.50¢ @ 18¢
"Anchor" Brand.	16.50¢ @ 17¢

Prices of Sheet and Bolt Copper, adopted by the Association of Copper Manufacturers of the United States, December 10, 1887.

Sizes of sheets.	Per square foot.							
	64 oz. and over.	32 oz. up to 64 oz.	16 oz. up to 32 oz.	14 oz. up to 16 oz.	12 oz. up to 14 oz.	10 oz. up to 12 oz.	8 oz. up to 10 oz.	Lighter than 8 oz.
Not wider than 30 in. & not longer than 72 in.	25	25	25	26	27	28	31	33
Not wider than 30 in. & long'r than 72 in.	25	25	25	26	28	30	34	
Not wider than 30 in. & not longer than 96 in.	25	25	25	27	29	33	36	
Not wider than 36 in. & long'r than 96 in.	25	25	26	28	30	34	38	
Not wider than 48 in. & not longer than 96 in.	25	25	27	29	31	35		
Not wider than 48 in. & long'r than 96 in.	25	25	28	30	32	36		
Not wider than 60 in. & not longer than 96 in.	25	25	30	32	37			
Not wider than 60 in. & long'r than 96 in.	25	26	31					
Not wider than 84 in. & not longer than 96 in.	26	27						
Not wider than 84 in. & long'r than 96 in.	27	28						
Over 84 in. wide	29	30						

All Bath Tub Sheets. 16 oz. 14 oz. 12 oz. 10 oz. Per pound. \$0.28 0.31 0.32 0.35  
Bolt Copper, 1/2 inch diameter and over, per pound. 25¢  
Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.  
Circles over 60 inches diameter, up to 96 inches diameter inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.  
Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.  
Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.  
Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.  
Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

### Copper Bottoms, Pits and Flats.

	Per pound
14 ounce to square foot and heavier.	33¢
12 ounce and up to 14 ounce to square foot.	29¢
10 ounce and up to 12 ounce.	31¢
Circles less than 8 inches diameter 2 cents per pound additional.	
Circles over 13 inches diameter are not classed as Copper Bottoms.	

### Roll and Sheet Brass.

Discount from list.	10 @ 30%
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### Spelter.

Duty: Pig. Bars and Plates, \$1.50 @ 100 lb.	
Western Spelter.	5¼ @ 6¢
"Bergenport"	7½¢

### Zinc.

Duty: Sheet, 2½¢ @ 100 lb.	
600 lb casks.	6¼¢
Per lb.	7 @ 7½¢

### Lead.

Duty: Pig, \$2 @ 100 lb. Old Lead, 2¢ @ 100 lb. Pipe and Sheets, 8¢ @ 100 lb.	
American.	5¼¢
Newark.	5¼¢
Bar.	5¼¢
Pipe.	7½¢, dis 20%
Tin-Lined Pipe.	18¢, dis 20%
Block Tin Pipes.	55¢, dis 20%
Sheet.	8¼¢, dis 20%

### Solder.

1½ @ 14.	24¢
Extra Wiping.	30¢
The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.	

## Antimony.

Cookson.	10¢ @ 10¢
Hallett's.	13¼¢

## FRENCH GLASS.

January 20, 1887.—Per Box 50 feet.

Sizes.	Single.			
	1st.	2d.	3d.	4th.
	EFH	IEH	HH	HB
25 6 x 8 to 10 x 15.	\$10.50	\$9.00	\$8.50	\$8.00
40 11 x 14 to 16 x 24.	11.50	10.75	10.25	9.75
50 18 x 22 to 20 x 30.	15.50	14.00	13.00	12.50
54 15 x 36 to 24 x 80.	16.50	15.00	13.50	
60 26 x 28 to 24 x 36.	17.75	16.25	14.75	
70 36 x 36 to 26 x 44.	19.00	17.50	15.25	
80 26 x 46 to 30 x 50.	21.00	19.50	17.00	
84 30 x 52 to 30 x 54.	22.00	20.25	18.00	
90 30 x 56 to 34 x 56.	23.00	21.25	19.00	
94 34 x 58 to 34 x 60.	24.00	22.75	21.00	
100 50 x 60 to 40 x 60.	26.50	24.50	23.00	

Sizes.	Double.			
	1st.	2d.	3d.	4th.
	EFH	IEH	HH	HB
25 6 x 8 to 10 x 15.	\$13.00	\$12.50	\$12.00	\$11.50
40 11 x 14 to 16 x 24.	16.00	15.00	14.50	
50 18 x 22 to 20 x 30.	20.50	19.50	18.50	
54 15 x 36 to 24 x 80.	22.00	20.75	19.50	
60 26 x 28 to 24 x 86.	25.00	23.00	21.50	
70 36 x 36 to 26 x 44.	26.00	25.00	23.00	
80 26 x 46 to 30 x 50.	28.00	26.50	24.50	
84 30 x 52 to 30 x 54.	30.00	28.00	26.00	
90 30 x 56 to 34 x 56.	31.00	30.00	28.00	
94 34 x 58 to 34 x 60.	32.50	31.00	29.00	
100 50 x 60 to 40 x 60.	36.00	32.50	32.00	

Sizes above—\$15 per box extra for every 5 inches Discount—70 & 10 & 5 %.

## Oils.

Bleached Whale, 1/2 gal.	40 @ 44¢
Bleached Sperm, 1/2 gal.	65 @ 73¢
Fish Oil, Pressed.	26¢
Lard, Prime Winter.	63 @ 64¢
Cylinder Oil.	70¢
Machinery.	45¢
Engine.	55¢
Linseed, Raw, in casks and bbls.	55 @ 56¢
Linseed, Hotted, in casks and bbls.	58 @ 62¢
Neatsfoot.	45 @ 65¢
Cotton Seed, Refined.	44 @ 46¢

## Haydock & Bissell, AUCTIONEERS.

By order of the Manufacturers and Importers, large special and peremptory sale of

## Table and Pocket Cutlery, Carvers and Butcher Knives, Plated Flat-Ware, &c., &c.,

On Wednesday and Thursday, Feb. 8th and 9th, at 10 o'clock,

At our salesroom, No. 12 Murray St. and 15 Park Place, New York.

This sale will comprise about 20,000 dozen Table Knives and Forks, Butcher Knives and Carvers, and will include all the second quality goods of the Lamson & Goodnow Mfg. Co., Landers, Fry & Clark, The Goodell Co., J. Russell Cutlery Co., Meriden Cutlery Co., Northampton Cutlery Co., American Cutlery Co. and the New York Knife Co.

### ALSO

Large Invoices of Pocket Cutlery, Silver-Plated Tea and Table Spoons and Forks, Plated Steel Knives, Cast Steel Shears, &c., &c.

Full particulars in next week's issue of *The Iron Age*.

**PATENT FOR SALE.**—A new and useful improvement in Packings for Piston Rods for Steam, Gas, Water and other engines, consisting in a peculiar combination, novel construction and arrangement of the various parts, lessening the friction upon the latter, improving them in minor details so as to impart superior advantages in points of simplicity and durability. Manufacturers of Steam engines will see the value of the invention. Particulars can be had through the

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